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STORY OF THE

BATTLE of BRITAIN

THE ROYAL NAVY

How the Home Fleet played a vital part in preventing a German invasion

EXCLUSIVE INTERVIEW
SIR MAX HASTINGS

Digital Edition

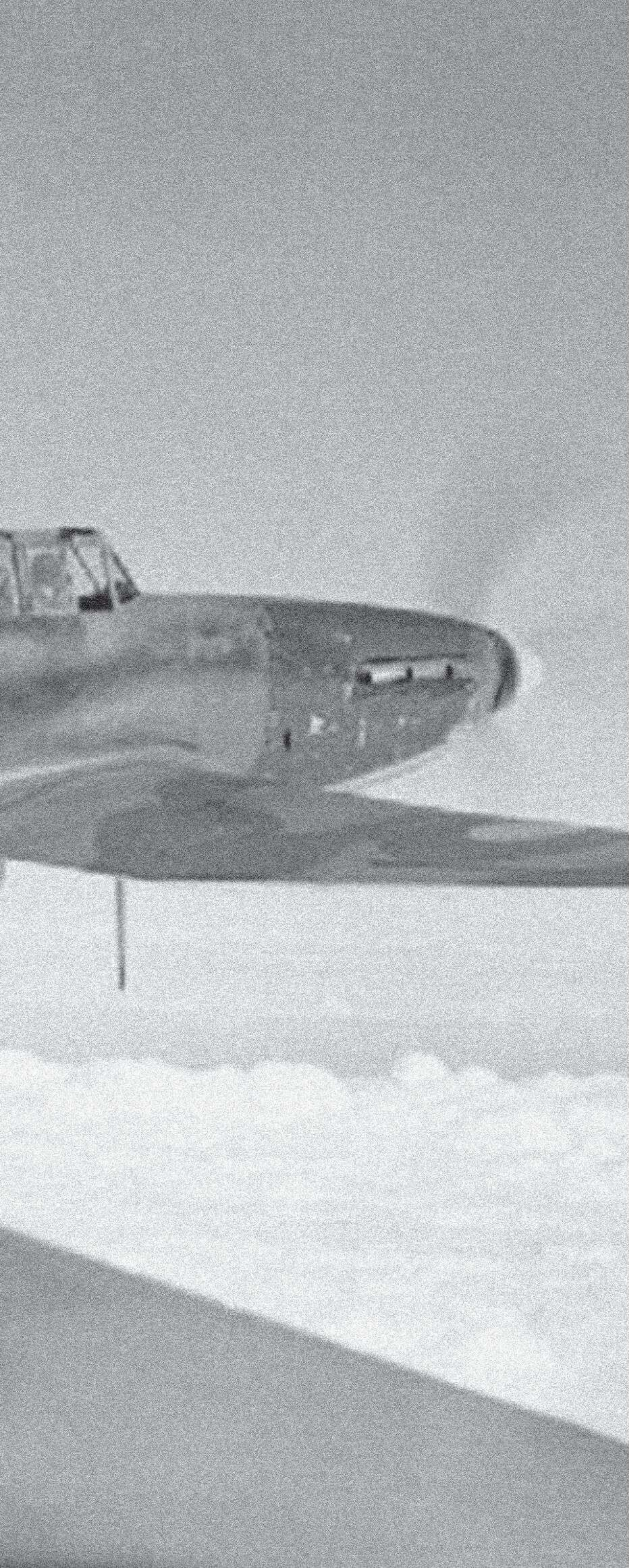
FUTURE FIRST EDITION



BRITAIN'S BRAVE FOREIGN FIGHTERS
Meet the pilots from overseas who took to the skies alongside the RAF

REMEMBERING THE FEW ★ THE WAAF ★ INSIDE THE LUFTWAFFE ★ THE COST OF DEFEAT





FIGHTERS INBOUND!

It is the summer of 1940 and Europe is on its knees. Using its now infamous 'blitzkrieg' tactics, Nazi Germany has stormed across the continent, annihilating every army sent to face it and carving a path from Warsaw to the Channel coast. Only Britain, a small island nation whose own forces only narrowly escaped destruction at Dunkirk, remains standing against a seemingly unstoppable war machine. Victory for the Third Reich is tantalisingly close, the Luftwaffe poised to crush the RAF and clear the way for a full-scale invasion. The Battle of Britain will decide the war in the West and force the world to acknowledge Germany's supremacy. Or will it?

In this bookazine you will climb into the cockpit of the iconic aircraft that defined the battle and take to the skies with the brave pilots who dared to stand against the mighty Luftwaffe. You will also meet the tireless men and women who worked relentlessly to keep Britain's fighters flying and chart the dives and dogfights that helped to turn the tide of the war.





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STORY OF THE BATTLE of BRITAIN

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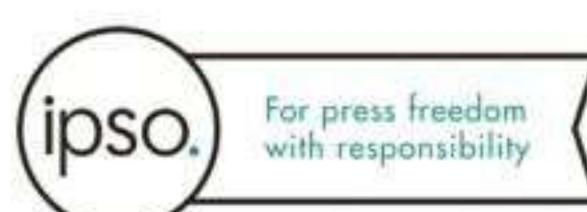
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of
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bookazine series





STORY OF THE
**BATTLE
of
BRITAIN**



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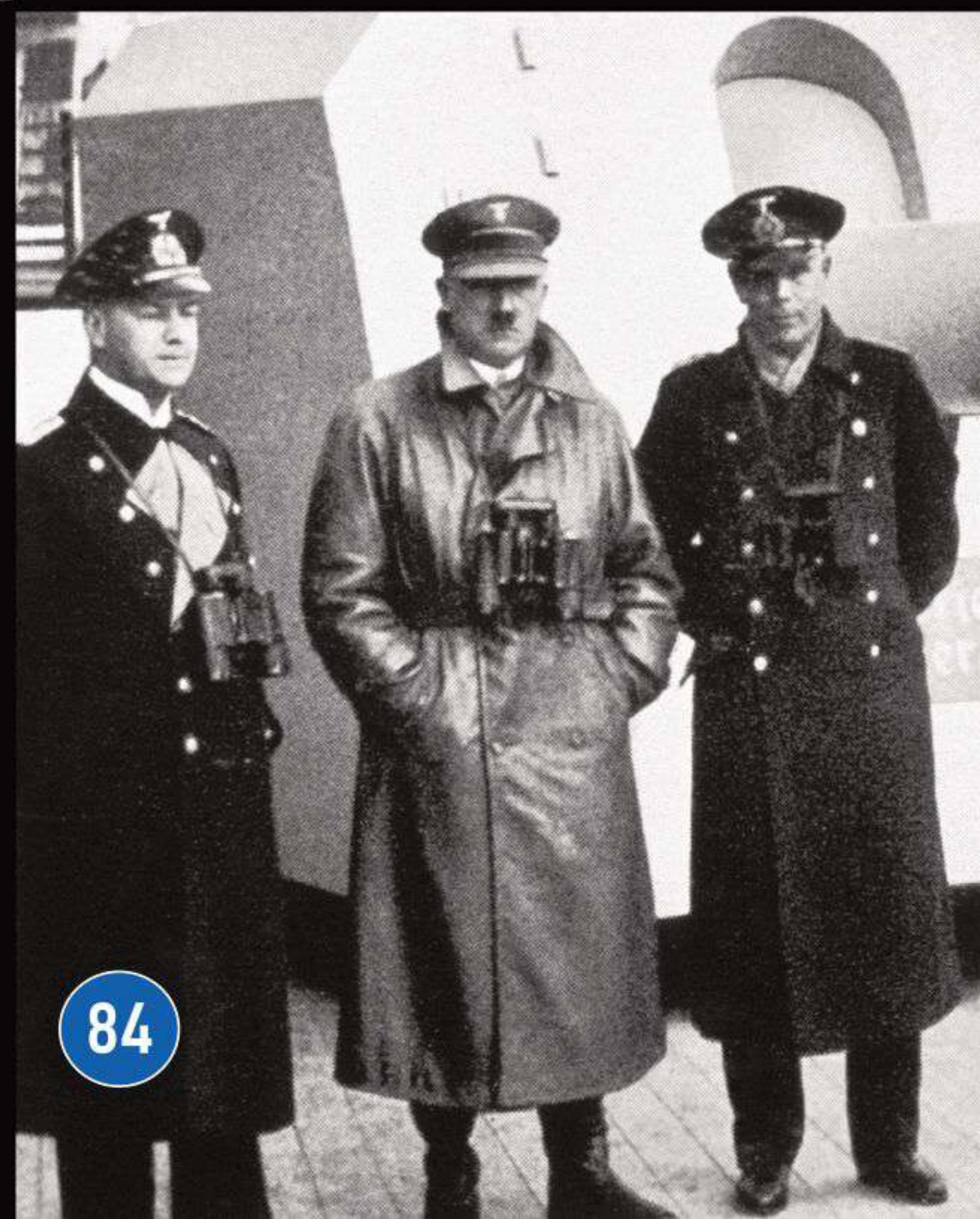
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Image: Piotr Forkasiewicz

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Image source: Getty





THE EVE OF BATTLE

In the summer of 1940 two very different air forces prepared to engage in the skies over Britain in a lethal tussle for dominance. One would rely on strength in numbers, while the other would deploy an ingenious air defence system in a bid to fight off the menace of invasion



“THE MAIN BLOW WAS TO BE MADE BY SPEARHEADS SWEEPING THROUGH THE ARDENNES REGION AND DOWN INTO FRANCE”

EUROPE ON ITS KNEES

WORDS WILLIAM WELSH

On the eve of the Battle of Britain Europe lay crushed beneath the iron boot of a relentless German war machine that seemed unstoppable

The contrast between the army of Nazi Germany and that of the Second Polish Republic on the eve of the German invasion of Poland could not have been starker. As it prepared to invade Poland, the German Wehrmacht deployed armoured columns supported by professional infantry and powerful artillery units on the Polish frontier. As for the Poles, they fielded infantry, cavalry and artillery units reminiscent of World War I.

The Germans crossed the Polish border on 1 September 1939, thereby starting World War II. The Poles had positioned one-third of their troops on the frontier, and most of these troops soon found themselves surrounded in pockets from which they had to try to fight their way out.

By 8 September the lead elements of the German 10th Army had reached the outskirts of Warsaw. German artillery and aircraft began to pound the Polish capital into submission.

The Poles were in for another shock. On 17 September the Red Army invaded eastern Poland as part of the secret Molotov-Ribbentrop Pact by which Germany and the Soviet Union divided up the country. The Poles promptly surrendered on 6 October. Hitler had his first victory of the war.

Invasion of Norway

Hitler's fear that Britain would occupy Norway compelled him to invade Denmark and Norway on 9 April 1940. Nazi Germany sought to control Norway to ensure the safe transit by sea of Swedish iron ore for its wartime economy and to build U-boat bases on its west coast.

Hitler believed it was essential to occupy Denmark so that the Luftwaffe could use Danish airfields to supply and support German units in Norway. The Danes surrendered on the morning of the attack.

Meanwhile, a large flotilla of German warships steamed north to Norway accompanying troop transports bearing 10,000 men. Troops were put ashore to capture Bergen, Narvik, Oslo, Tromsø, Stavanger and Trondheim.

A crucial advantage the German forces had over the Allied troops that landed to assist the Norwegians was complete control of the skies.

In the decisive Second Battle of Narvik on 13 April, a large British flotilla consisting of the battleship HMS Warspite and nine destroyers sunk all of the German vessels in the harbour. Subsequently, Allied ground forces seized Narvik on 27 May, but these forces were withdrawn on 7–8 June. Norway gave up the fight soon after on 10 June.

War in the West

The Allies felt a deep sense of foreboding as 2.5 million German troops massed on the borders of



Victorious Wehrmacht soldiers march towards the Arc de Triomphe in the wake of the defeat of France

the Low Countries and France following the fall of Poland. Fearing Hitler's wrath, Holland remained steadfastly neutral. However, the Belgian army mobilised in August 1939.

The French believed that the Maginot Line, a string of fortifications from Switzerland to the Belgian border, would stop cold any German attack. But since the Maginot Line ended at the Belgian border, its northern flank could be turned by an attack through the hilly Ardennes region of Luxembourg and southern Belgium, an area deemed impenetrable by the French.

The German strategy called for a strong feint into the Low Countries to pin down Allied forces in Belgium while the main blow was to be made by armoured spearheads that would sweep through the Ardennes and into France.

Generaloberst Gerd von Rundstedt's Army Group A was entrusted with operations against Holland and Belgium, while Generaloberst Fedor von Bock's Army Group B, which had seven German panzer divisions, would advance through the Ardennes region, thereby skirting around the Maginot Line.

Retreat to Flanders

The Germans attacked Belgium, Holland and France simultaneously on 10 May. The Luftwaffe committed 4,000 airborne troops and 12,000 light infantry to the invasion of Holland, where they were to seize bridges, airfields and canal locks. The Dutch army defended the airfields stoutly with their machine guns, cutting down droves of

lightly armed German paratroopers and glider troops as they landed.

While negotiations were underway for the Dutch surrender on 14 May, a flight of 54 German medium bombers unloaded 90 tons of ordnance onto Rotterdam. The 'Rotterdam Blitz' shocked the West and stunned the Dutch into submission the following day.

The Belgian army joined with French and British soldiers in an effort to check the German advance by taking up defensive positions behind the Dyle River. French and British armoured and motorised divisions raced north to reinforce the Belgians, thereby playing directly into German hands. The Germans' rapid advance through the Ardennes turned the right flank of the Dyle Line. The Allied forces in Belgium had no choice but to withdraw in late May to West Flanders, where they made a last-ditch stand. It proved ineffective and too little too late for Belgium, which followed its Dutch neighbour and duly surrendered on 28 May.

Race to the Channel

Rundstedt's hard-charging panzers reached the Meuse River via the Ardennes in just three days. After smashing their way through the weak French forces defending the Meuse Line, the German panzer spearheads raced towards the English Channel. General Heinz Guderian's XIX P Corps reached the stretch of water

separating Britain and the continent on 20 May. By reaching the Channel, the Germans succeeded in bottling up the French 1st Army and the British Expeditionary Force in a large pocket in Flanders.

The British subsequently, and somewhat incredibly, managed to evacuate approximately 380,000 British and French troops from Dunkirk as Marshal Philippe Pétain prepared to sign an enforced armistice on 25 June. The Germans now occupied two-thirds of France, leaving the other third to be ruled from Vichy by the turncoat Pétain. Britain now stood completely alone in Europe, the only nation still in a fight that looked doomed to end in failure. The coming Battle of Britain would decide her fate.



German panzer units race through France towards the English Channel



DEFENDERS OF THE SKIES

WORDS TIM WILLIAMSON

With war looming, the RAF rearmed and reorganised to face the Nazi threat

After the end of World War I the RAF was the largest air force in the world, but it was dramatically reduced in size as Britain's military moved from a wartime to a peacetime footing. Until the real threat of a new war became a reality in the minds of politicians and the public, the force struggled for its very survival. Its independent status and financial cost continued to be questioned and debated, almost right up until the outbreak of World War II. By 1940, however, the RAF was about to prove its vital role in defending Britain against invasion.

1920s: racing and rearming

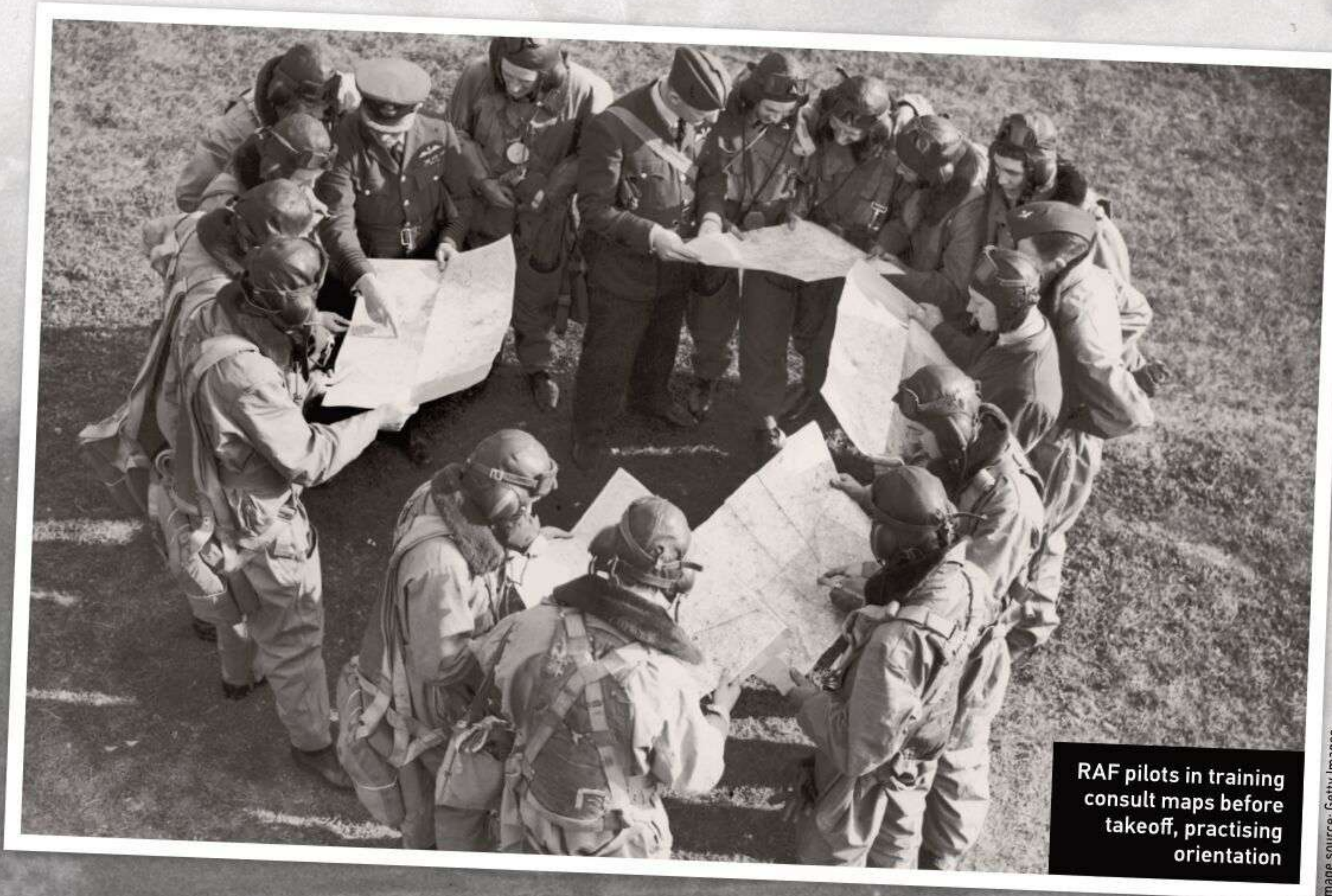
In 1919 the RAF took part in the brief Third Afghan War, and, throughout the 1920s and early 1930s, it was only kept busy with minor provincial policing duties across the still vast British Empire. Around the same time, RAF bombers and fighters proved useful during minor conflicts in Somaliland and

again in Afghanistan. In Singapore and Hong Kong, Supermarine Southamptons and other flying boats were gradually supplied to protect British interests, if only as a show of force.

While the skies over Europe were no longer host to vicious, high-speed dog-fights, interest in aviation continued to grow. For those who could afford it, flying was still a new, exciting pastime, attracting rich thrill-seekers. Despite its reduced role, the RAF continued to recruit new trainee pilots in the interwar period, who attended the RAF Flying Training School to earn their wings. Trainee pilots would clock up around 200-320 flight hours before qualifying for selection for specialist preparation in Operational Training Units. Though extensive, the sluggish pace of this training would soon speed up as the demand for more pilots increased.

On the ground, engineers and design teams were in fierce competition to create the next

Hurricanes of No. 73 Squadron in formation over France, April 1940



RAF pilots in training consult maps before takeoff, practising orientation

Image source: Getty Images



Image source: Getty Images



A Coastal Command Lockheed Hudson crew rest before going on reconnaissance patrol, April 1940

Image source: Getty Images

generation of aeroplane design, tweaking engines and airframes to maximise speed and efficiency. With no battlefields to contest, friendly competitions and races were held to test the skills of pilots and designers. The Schneider Trophy Race was one such contest, with national teams submitting their fastest seaplanes into time-trial races – between 1927-31, the trophy was won by the British team. The Supermarine seaplane, with its sleek design and powerful Rolls-Royce engine, would prove to be a significant development in the history of the RAF and lead to the iconic Spitfire fighter plane.

However, it was not long before the friendly contests dispersed in the face of looming conflict. Two years after seizing power in Germany, Hitler openly claimed to have already built an air force to match the size of the RAF and was seeking to outmatch the French in similar fashion. Troubled by the growing Nazi threat, the British Air Ministry ramped up its rearmament plans. In 1938 the first Spitfires entered service, following close behind the Hawker Hurricane, which had begun its RAF service the previous year. Both aircraft arrived just in time and would play critical roles in the Battle of Britain. At the outbreak of war, the RAF



THE WORLD'S FIRST AIR FORCE

AT THE OUTBREAK OF WWII, THE RAF HAD EXISTED FOR JUST 21 YEARS

The Royal Air Force was officially formed on 1 April 1918, just months before the end of World War I. It combined the Royal Flying Corps (RFC) and the Royal Naval Air Service (RNAS) to become the world's first independent – and largest – air force. Previously the RFC and RNAS had occupied a precarious position within Britain's traditional military structure, which naturally focused heavily on the navy and army. The RFC and RNAS were separately controlled by the army and the admiralty respectively,

and the two branches were fiercely competitive over resources, finances and military strategy. During the German airship raids over Britain, for instance, the two organisations made little effort to cooperate and communicate in order to organise an effective defence.

As the war continued, it became clear that a unified air force, independent of the Admiralty and Army, was required to better suit the changing demands of the war. However, only seven months after the RAF was founded the Armistice

was signed and peace broke out. The British Government began a rapid reduction in military spending as it took stock of the immense financial cost from four years of war. In 1918, there were 291,000 personnel in the RAF and 263 squadrons – this was reduced significantly to just 31,000 personnel and 17 squadrons by the following year. It was not expected that the nation would require such a large air force within a decade, but careful restructuring ensured there were enough trained airmen in case of an emergency.

Officers of the Royal Air Force, photographed on 1 April 1918



Image source: Getty Images

possessed around 550 Hurricanes and more than 300 Spitfires, though production of both rapidly increased by the summer of 1940.

New commands

In 1936, the RAF was restructured into four sections called Commands; these were Coastal, Bomber, Training and Fighter Command. Though Fighter Command would bear the large responsibility – and arguably the enduring credit – for defending Britain's airspace during World War II, the other Commands were also critical components in the RAF's victory.

While Fighter Command dealt with the sharp end of the German attack, for the most part high above the Home Counties, Bomber and Coastal Commands would go on the counter-offensive, targeting enemy airfields, ports, infrastructure and supply routes and anything else that would slow or halt an imminent Nazi invasion. In fact, these operations began several weeks before the official start of the Battle of Britain. In the wake of the devastating German invasion of France and the Low Countries in May 1940, both commands flew daily sorties over the English Channel and occupied countries.

At the start of the war, Coastal Command's primary directive was to patrol the seas, guarding against enemy access to the Atlantic and protecting shipping from U-boat attacks. However, the Command was poorly equipped and was considered a lower priority for new aircraft and armaments. At times it was even forced to borrow aircraft from other Commands to operate effectively. After suffering losses during the Battle of France, the Command numbered only around 500 aircraft, including Sunderland flying boats, as well as Avro Anson, Blenheim, Wellington, Hudson and some outdated models. Nonetheless, these coastal defenders were tasked with not only anti-submarine patrols but also bombing enemy ships and ports to prevent any invasion attempt. The Command also possessed a number of Spitfires, which were fitted with cameras for aerial reconnaissance of the Channel and enemy movement – intelligence that would be vital for Britain's defence.

In 1939, Bomber Command was a fraction of the size it would grow to become by the end of the war. With only around 280 bombers immediately available on any given day, the force was dwarfed by Germany's own bomber fleet, and early in the war was found to be incredibly ineffective in inflicting any significant blows against enemy targets. Like other Commands, the bomber fleet was split into six separate Groups, and at the start of the war a special detachment of ten squadrons, called the Advanced Air Striking Force, was sent to France along with the British Expeditionary Force.

During the interwar period, it was believed that bombers would play a huge role in any future conflict, though by the mid-1930s both equipment and numbers were severely lacking. In 1939 it was expected that bomber crews would be able to navigate their way to enemy targets using nothing other than Dead Reckoning navigation (estimating using only landmarks and basic calculation for guidance), or even by navigation by the stars. Daylight missions were quickly abandoned after German air defences proved too effective, leaving Bomber Command unable to carry out little more than reconnaissance and propaganda leaflet drops



WOMEN'S AUXILIARY AIR FORCE

THE WAAF FORMED THE BACKBONE OF BRITAIN'S DEFENCES DURING WWII

In 1939, the British Government wasn't only making preparations for arming its frontline forces – it was busy galvanising the home front and supporting services too. Many of these organisations, such as the Women's Land Army, had originally been formed during World War I, in order to support the frontline and replace roles vacated by the men who had signed up to fight. In 1939 the Admiralty reformed the Women's Royal Naval Service (the 'Wrens'), while the Army created a new Auxiliary Territorial Service (ATS, formed in 1938), and the Air Ministry created the Women's Auxiliary Air Force (WAAF). Officially established by King George VI on 28 June 1939, the force was mobilised just two months later, days before the invasion of Poland.

Formed with 1,700 volunteers, the WAAF grew to more than 8,000 members in the first month of the war and reached its peak of more than 180,000 in 1943. However, few could have imagined the critical role the WAAF would play during the Battle of Britain. Though prejudice still presided in society



A WAAF leading aircraftwoman taking a meteorological reading, 1943

regarding the 'suitability' of jobs for females, the women of the WAAF served in a huge number of often dangerous positions throughout the war. These included radio operators, Operations Room plotters, RADAR technicians, chefs, anti-aircraft crews, ground crews and more. Later in the war, several WAAF members were also recruited by the Special Operations Executive to conduct espionage missions in enemy territory. A number of WAAF members were also recruited for code-breaking efforts, based in the secretive Bletchley Park.

Flying ace Miroslaw Ferić (far left) with other members of 303 Squadron at RAF Northolt





THE EVE OF BATTLE

– a staggering 18 million leaflets were dropped by Bomber Command in the first month of the war. However, like Coastal Command, Britain's bombers would nonetheless prove useful in disrupting German preparations for invasion.

The rise of Fighter Command

At the start of World War II, Fighter Command was organised into three Groups covering British airspace: 11 Group covered the entirety of southern England and south Wales, 12 Group covered the Midlands and the remainder of Wales, and 13 Group spanned the North of England and Scotland. This organisation had remained much the same since 1918, but by 1940 it became clear that change was required in order to effectively defend British airspace. By the beginning of the Battle of Britain, 10 Group was reformed to cover the South West of England, enabling 11 Group to concentrate its resources on the vulnerable South East, including London. 14 Group was reformed in June 1940 to cover Scotland's airspace.

Each Group was subdivided into Sectors, each with its own station and main airstrip, to which squadrons would be assigned. Each Group was responsible for engaging enemy aircraft identified within its region – with enemy numbers, altitude and location all relayed to the Group Headquarters through the Dowding System, which was named after Fighter Command's Commander-in-Chief.

A veteran of the Royal Flying Corps, Air Chief Marshal Hugh Caswall Tremenheere Dowding was on the verge of retirement in 1939, but with conflict looming he remained in his post to lend



The Supermarine S.6B being launched for flight, in preparation for the 1929 Schneider Trophy Race

Image source: Getty Images

his experience. In 1936 he had been made the first Commander-in-Chief of Fighter Command and was responsible for organising the country's air defences. Reporting to Dowding were his Group Commander-in-Chiefs, including his former senior air staff officer, Air Vice-Marshal Keith Park, who commanded 11 Group.

Being the closest point geographically to occupied France, as well as covering the capital, it was correctly anticipated that 11 Group would be the focus of enemy attacks, and it was therefore a priority. With its HQ at RAF Uxbridge, not far from Fighter Command's overall HQ at RAF Bentley Priory, 11 Group covered seven sectors. Eventually, each of these sectors would be supported by up to ten squadrons, though numbers varied throughout the war. To the north, in the Midlands, 12 Group was commanded by

Trafford Leigh-Mallory, who clashed with Park and Dowding over Fighter Command's tactics.

Each RAF squadron was divided into two Flights, each with two Sections of three planes, making a total of 12 immediately available aircraft per squadron. Available numbers varied day to day as planes were lost or damaged, and RAF ground crews worked tirelessly to rearm, refuel and repair aircraft, getting them back in the sky. By 10 July 1940, Fighter Command had 644 fighters operational, not including those aircraft in France, or in reserve.

1940: The Battle of France

At the outbreak of the war, in September 1939, the RAF set up the British Air Forces in France (B.A.F.F) under the command of Air Marshal Sir Arthur Barratt, tasked with supporting the British

Spitfires from No. 65 Squadron flying in formation, May 1939

"IN 1939, WITH ONLY AROUND 280 BOMBERS AVAILABLE ON ANY GIVEN DAY, THE FORCE WAS DWARFED BY GERMANY'S OWN BOMBER FLEET"



Image source: Getty Images



RAF airmen pictured after practising for the 1927 Hendon Air Pageant

Image source: Getty Images



King George, in RAF uniform, with Air Chief Marshal Hugh Dowding, September 1939

Expeditionary Force from airfields in France. The B.A.F.F. included Bomber Command's Advanced Air Striking Force and also an Air Component of reconnaissance squadrons, and Nos. 1, 85, 87 and 73 fighter squadrons. This expeditionary air force was mostly made up of dated Fairey Battle and Blenheim bombers supported by Hawker Hurricane fighters. However, the rapid German offensive in May 1940 gave the airmen little time to make a significant impact before being forced to retreat, and they suffered horrific losses.

B.A.F.F.'s Hurricane squadrons began engaging the Luftwaffe from the first day of the invasion. No. 85 Squadron, for instance, recorded 17 enemies destroyed on 10 May alone. Sadly, by the end of the Battle of France, the squadron was reduced to just four remaining aircraft. Britain's bombers in France were also tragically torn apart by the enemy. In one day, on 14 May, 71 Blenheim and Fairey Battle bombers attacked German crossing positions over the Meuse River, but 40 were destroyed by Me 109s or well-prepared anti-aircraft fire.

After the huge losses suffered by B.A.F.F in the opening days of the invasion, Air Chief Marshal Dowding personally wrote to Churchill asking him not to send more squadrons to France for fear

of suffering further losses, which would strip Britain of its crucial airborne defenders. "If the Home Defence Force is drained away in desperate attempts to remedy the situation in France," he wrote, "defeat in France will involve the final, complete and irremediable defeat of this country." The War Cabinet listened to Dowding's caution, and the number of reinforcements sent to operate from France were limited. This is considered to be a critical moment in the outcome of the Battle of Britain.

During Operation Dynamo, the evacuation of British and French forces from Dunkirk in May/June 1940, fighter squadrons from 11 Group were sent to engage with the enemy, providing air cover as best they could to protect the vulnerable troops on the beaches. However, the overwhelming number of enemy aircraft meant many slipped through this defensive effort. Operating from British soil, the RAF aircraft were forced to the limits of their range in order to provide effective daylight cover over Dunkirk. Luftwaffe bombers were able to target transport ships, prompting outrage among some who felt the RAF was absent from the fight.

Despite this criticism, 177 Fighter Command aircraft were lost during Operation Dynamo. Reflecting on the retreat and evacuation, Churchill famously paid tribute to the airmen of the RAF, whom he declared had achieved a victory out of the evacuation through their efforts in hampering the Luftwaffe's attacks. Among those evacuating from France were many Polish pilots, exiled from their homeland after the Nazi invasion but determined to continue the fight.

These men, alongside pilots from across the British Empire and elsewhere, would prove to be critical in the coming months. With the continent in the grip of a seemingly invincible German military, it would fall to these courageous pilots to provide the world with a ray of hope.

Air Vice-Marshal Sir Keith Park, commander of 11 Group during the Battle of Britain

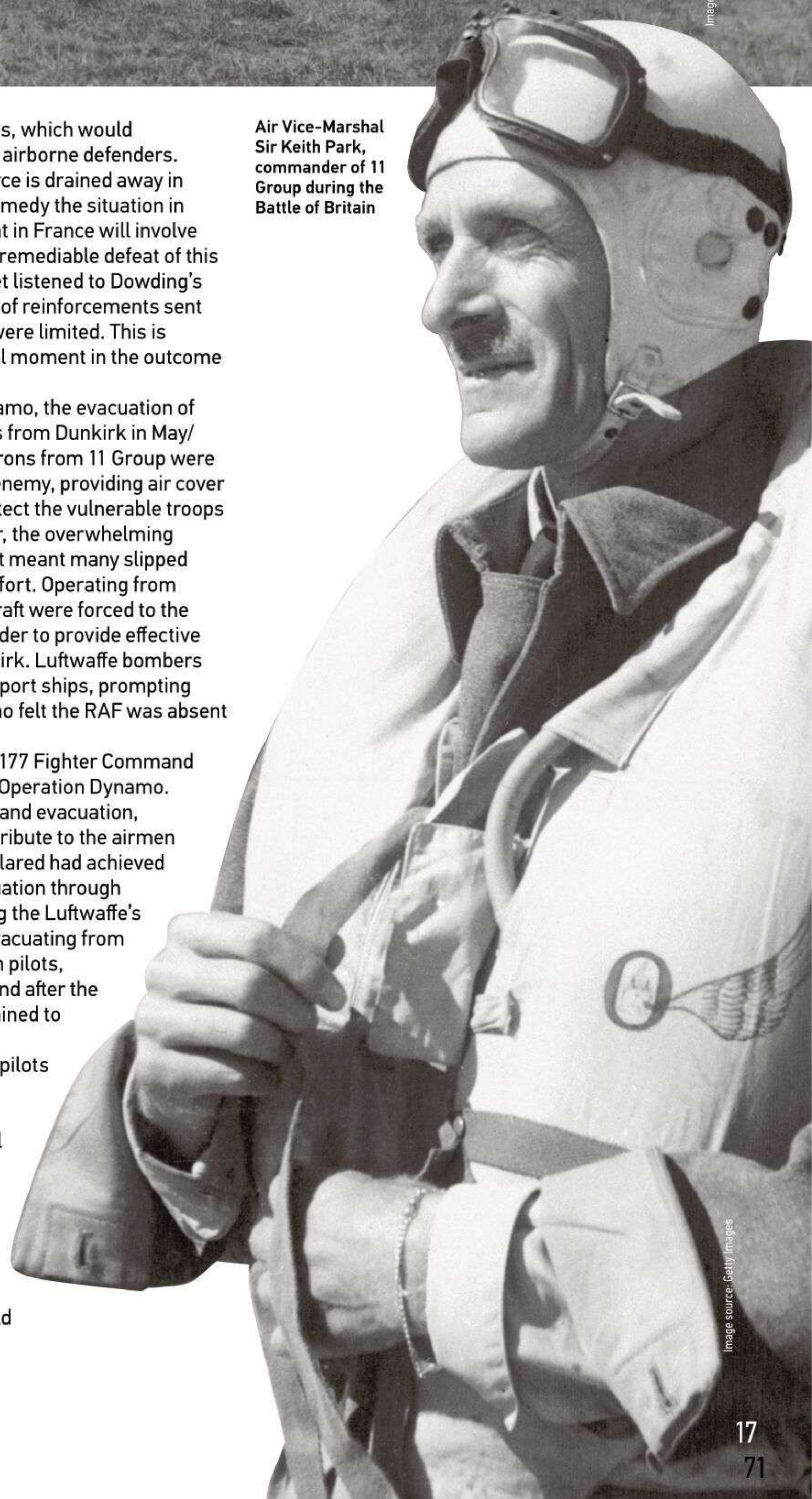
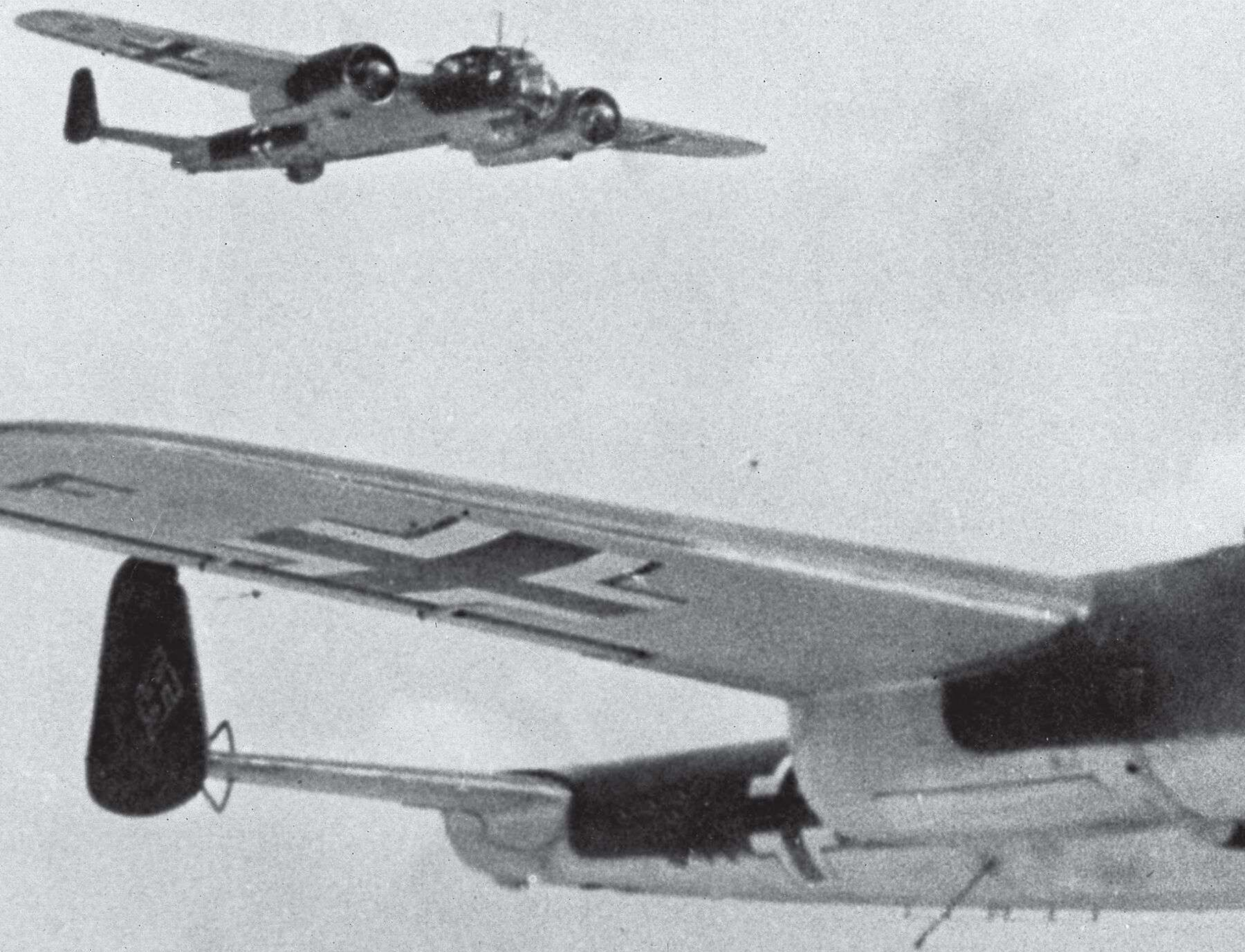
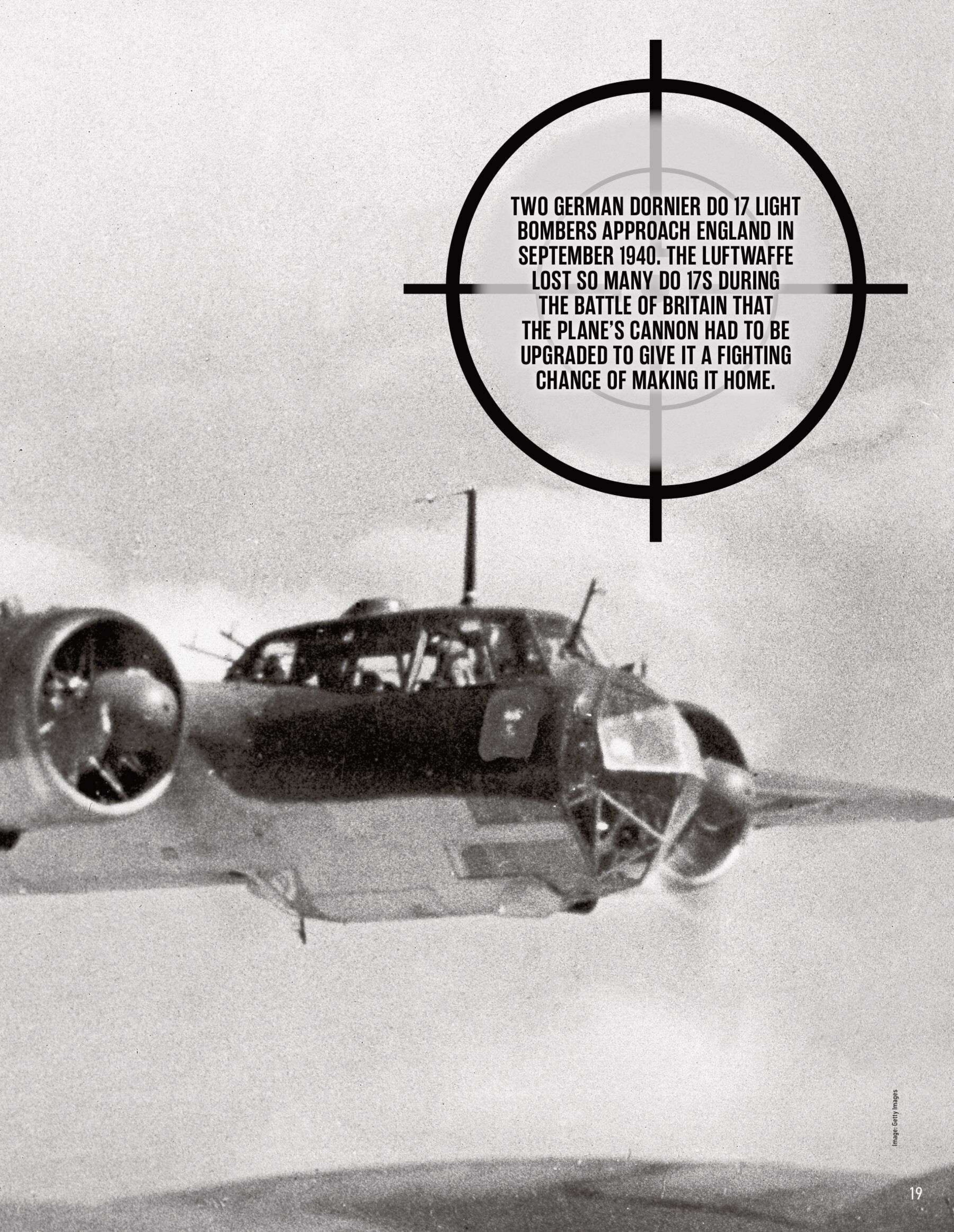


Image source: Getty Images





**TWO GERMAN DORNIER DO 17 LIGHT
BOMBERS APPROACH ENGLAND IN
SEPTEMBER 1940. THE LUFTWAFFE
LOST SO MANY DO 17S DURING
THE BATTLE OF BRITAIN THAT
THE PLANE'S CANNON HAD TO BE
UPGRADED TO GIVE IT A FIGHTING
CHANCE OF MAKING IT HOME.**



THE EVE OF BATTLE

THE RISE OF THE LUFTWAFFE

WORDS GERSHON PORTNOI

Despite humble beginnings, by the eve of the Battle of Britain the Luftwaffe was the most feared air force in the world



In July 1940, with Germany having established a secure base in northern France from where to begin its next assault against Britain, the stage was set for one of the most epic and defining battles of World War II.

In less than a year Adolf Hitler's forces had swept all before them, scoring notable victories in Poland, Denmark, Norway, Belgium, Holland and France. These triumphs were largely due to Germany's 'blitzkrieg' attacks, in which the Luftwaffe struck key targets, paving the way for panzer divisions of tanks and troops to roll in to finish the job started in the skies.

Naturally, some losses were incurred in battles – notably in France, where the Luftwaffe had engaged with the RAF – but with an incredibly high production rate, Germany's air power remained superior to that of the Allied forces, outnumbering Britain's aircraft by four to one. However, following the evacuation of Dunkirk, when Allied forces were

able to flee to Britain, there were question marks over the Nazi strategy. Because the Luftwaffe's role was largely to provide close air support to the ground forces, whether it could operate a campaign on its own was still unknown.

But, on the surface, on the eve of the confrontation with Britain it was difficult to see past a German victory given the combination of its numerical advantage and its formidable track record.

Indeed, when American aviation ace Charles Lindbergh had visited Germany the year before war broke out, he was hugely impressed with the might of the Nazi aerial threat: "Germany now has the means of destroying London, Paris, and Prague if she wishes to do so," he warned in a secret memo sent to US ambassador to Britain, Joseph Kennedy.

That was a far cry from the Luftwaffe's humble beginnings, as it grew out of the remains of the

Flying Corps that had been disbanded under the terms of the Versailles peace treaty following World War I.

Germany set up civilian airline Deutsche Lufthansa in 1926, which it used to train the pilots who would go on to serve the Luftwaffe. It used commercial airliners, like the Heinkel He 111, for its clandestine activity, as the plane was designed with a large smoking compartment that was eventually cleared of seats so it could be turned into a bay for storing bombs.

However, the scale of the domestic operation was not enough to cater for the specific purposes of piloting military planes, so Germany established a top-secret airfield in the Soviet city of Lipetsk, where its air crew trained until 1933, only a decade before they would be flying bombing sorties over the very country in which they were training.

With Hitler in power, the Luftwaffe was officially formed in 1935 under the command of Hermann

German Junkers Ju 87 Stuka dive bombers fly in formation over France





HERMANN GÖRING: THE MAN WITH TOO MUCH ON HIS PLATE

WHY THE LARGER-THAN-LIFE LUFTWAFFE COMMANDER-IN-CHIEF WAS DOOMED TO FAIL

The Nazis could never have found a more charismatic leader of the Luftwaffe than Herman Göring – the problem was that was also to the detriment of its air force.

While Göring, known as 'Der Dicke Hermann' (Fat Hermann), was famously a flamboyant, larger-than-life character who owned pet lions and loved food, wine, art and hunting, by the time he assumed command of the Luftwaffe in 1935 he was out of touch with modern aircraft and aerial warfare and strategically naïve.

Göring had been awarded the Blue Max – his country's highest combat award – for his 22 victories in World War I, in which he'd succeeded the 'Red Baron' Manfred von Richthofen to take command of the much-heralded Flying Circus (Jagdgeschwader 1).

His fortunes changed in 1923 when he was forced to flee from Germany after being shot during the Beer Hall Putsch – Hitler's failed attempted coup of 1923 – and he went on to develop a lifelong painkiller addiction, which also saw him twice hospitalised in a Swedish asylum.

He eventually became Hitler's most loyal associate, being named the Führer's successor in 1939 and awarded the title of Marshal of the Empire a year later, but he was given responsibilities far outweighing his abilities, which would prove disastrous for the Luftwaffe.

Hitler charged his right-hand man with preparing the economy for war, in the shape

of the Four Year Plan, and Göring was also given responsibility for his country's foreign exchange reserves.

Given the Luftwaffe Commander-in-Chief's many distractions, he handed huge power to his friend Ernst Udet, who made poor decisions like scrapping the late General Wever's plans for a long-range heavy bomber.

Ultimately, this left the air force going into war with out-dated bombers that were no match for the requirements of their forthcoming battles with Allied forces.



Hermann Göring, the Commander-in-Chief of the Luftwaffe, playing with a pet lion cub in 1938

Göring, by which time it already boasted 1,800 planes and 20,000 personnel. Göring was a World War I flying ace himself, going on to lead the squadron of celebrated German pilot Manfred von Richthofen, otherwise known as the Red Baron.

Strategically, Göring and other senior officers followed the 1935 doctrine known as Conduct of the Air War, which stipulated that the Luftwaffe's main focus was to target enemy troops and provide close air support to the ground forces.

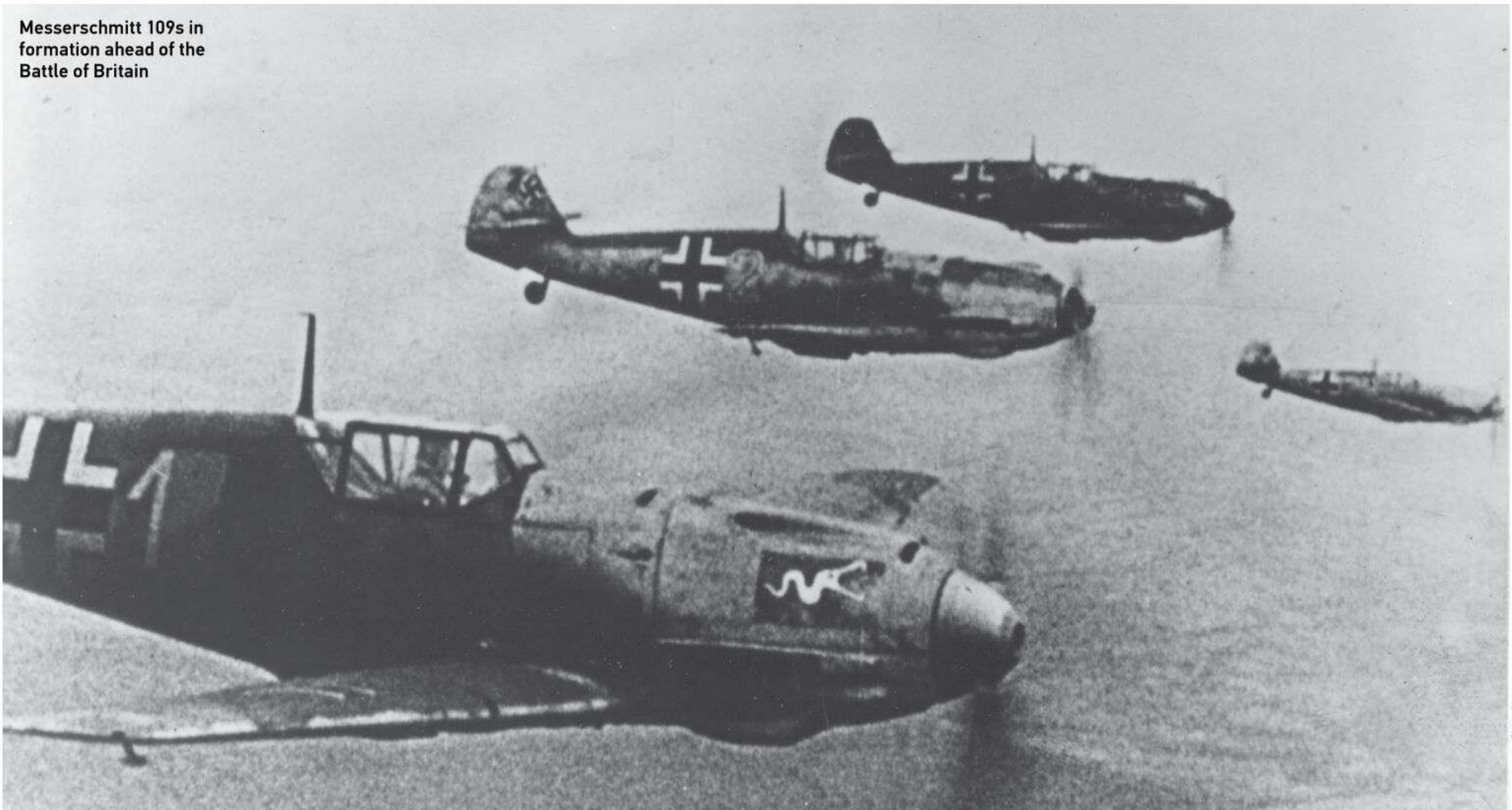
A great deal of the bombing work would be carried out by the Junkers Ju 87 Stuka dive bomber, which was capable of operating from low altitudes. Not only was it capable of wreaking havoc on opposition troops, planes, supply and communications lines, but the Stuka also looked and sounded terrifying thanks to its wheel spats, gull wings and piercing, wind-powered siren as it swooped in on a target.

Alongside the He 111, Dornier Do 17 and Junkers Ju 88, all of which could bomb from medium-to-high altitudes, were the Luftwaffe's fighter force, or Jagdwaffe, made up of two Messerschmitts: the Bf 109E and the Bf 110C. The latter was a twin-engine two-seater, while the former was the single-engine, single-seat jewel in the Luftwaffe's crown.

Designed by its namesake Willy Messerschmitt, the fighter was the most technologically advanced plane of its kind when it debuted in 1935, housing a powerful engine inside its tight fuselage. The 109 carried two 7.92mm machine guns, alongside two 20mm cannons, and it would go on to become the most successful aircraft of the entire war in terms of victories.

The Luftwaffe's first Chief of Staff, General Walther Wever, had his heart set on developing a long-range heavy bomber, but those plans were scrapped after his premature death in a flying accident. The failure to keep faith in the four-

Messerschmitt 109s in formation ahead of the Battle of Britain



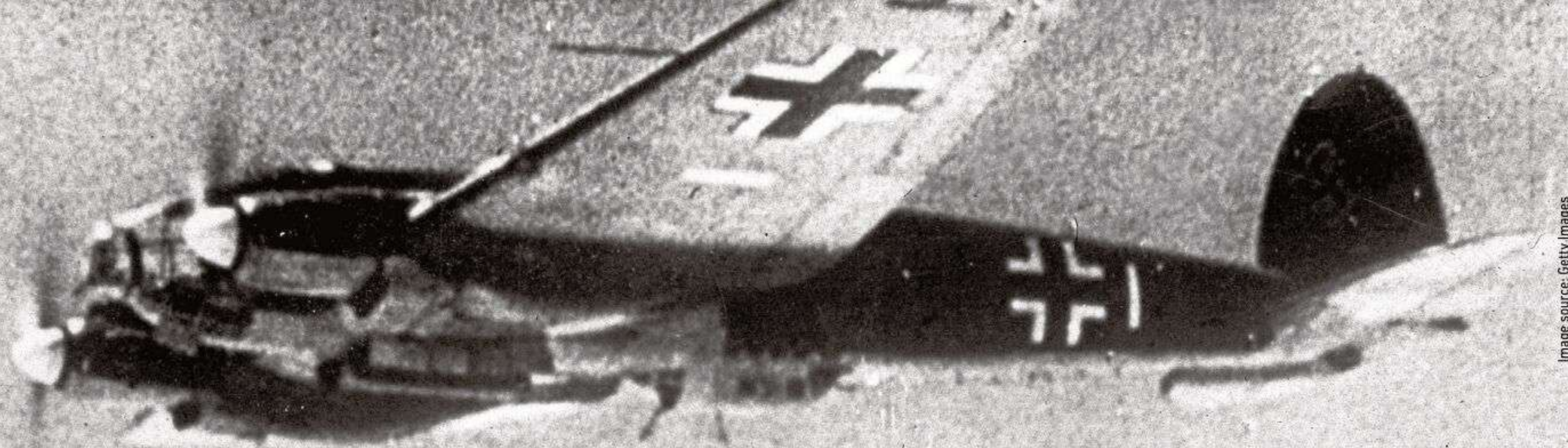


Image source: Getty Images

“THE CIVIL WAR IN SPAIN HANDED THE LUFTWAFFE A PERFECT OPPORTUNITY TO TEST OUT THE CAPABILITIES OF ITS FIGHTERS AND BOMBERS”

engine bomber and the decision by new chiefs Ernst Udet and Hans Jeschonnek to put all the air force's eggs in the dive-bombing basket would have serious repercussions for the war effort, leaving the Luftwaffe with obsolete bombers instead of the mighty, four-engined machines like America's Boeing Flying Fortress and the Consolidated B24 Liberator, which served the Allies so well. In 1942, when Germany introduced its own heavy bomber, the Heinkel He 177, it was a case of too little, too late.

The Luftwaffe was structured around its squadrons, with each one consisting of around nine aircraft. Three or four squadrons would make up a group, and the same number of groups comprised a wing. In addition to the wings, there were also flying corps and air fleet commands known as Luftflottes.

In terms of numbers, at the outbreak of war Germany had 1,000 bombers and 1,050 fighters, as part of a force of 4,733 combat planes, in addition to 3,562 other aircraft. At that point, Germany was capable of producing 500 planes each month.

On the eve of the Battle of Britain, the Luftwaffe could boast around 3,000 combat aircraft, of which they committed 1,300 bombers and 1,200 fighters, meaning it was considerably larger than the RAF it was about to face.

The bombers, and in particular the Stukas, were essential to war strategy of blitzkrieg, which was employed in all of Germany's early victories. This 'lightning war' concept was the brainchild of General Heinz Guderian, with the idea being that the joint attacks of German panzer divisions on the ground and dive bombers in the air would cause huge damage and panic in enemy lines, allowing the Wehrmacht to sweep all before them.

Three years before this was put into operation, the outbreak of the civil war in Spain handed the Luftwaffe a perfect opportunity to test out the capabilities of its fighters and bombers and rehearse aerial attack formations.

As a result, thousands of German pilots flew sorties over Spain as part of the Condor Legion, which Göring sent to support General Franco's Nationalists. This was the first time the likes of the

Me 109 had seen combat, supported by the He 111, Do 17 and, of course, the Stuka dive bombers.

The results were devastating, with one particularly brutal attack on the Basque town of Guernica in April 1937 killing approximately 1,000 people and planting the idea in the minds of the future Allied forces that the Nazis would use terror bombing tactics on civilian targets in all conflicts.

Junkers Ju 87 Stuka dive bombers
being built on a production line
during the war



Image source: Getty Images



THE EVE OF BATTLE

Luftwaffe pilots standing beside a Messerschmitt Bf 109



Image source: Getty Images

“ONLY WEEKS BEFORE THE BATTLE OF BRITAIN, THE LUFTWAFFE HAD LOST AN ESTIMATED 28 PER CENT OF ITS FRONT LINE COMBAT FORCE”

It was during these campaigns that the RAF and Luftwaffe first engaged, playing out some early versions of the dogfights that would become key in the Battle of Britain.

The opposing forces first met in the skies over Norway in 1940, where the Luftwaffe scored some considerable successes, destroying 96 RAF aircraft, including 43 in air-to-air combat. Although Allied forces held a numerical advantage over the Germans on land and sea, it was the Luftwaffe's aerial superiority that enabled Germany to win control of the Scandinavian nation – alongside the withdrawal of Allied forces, who were urgently needed in France. In addition, despite the Luftwaffe's limitations when attacking naval vessels, it managed to sink a cruiser, six destroyers and 21 warships.

Soon after, in the RAF's battle with the Luftwaffe over the Netherlands, the British force managed to destroy or damage more than 170 German planes, but it was to no avail as the Dutch surrendered due to the pressure they faced on the ground.

In Belgium, the Luftwaffe helped sweep Germany to victory with gliders and paratroopers reinforced by infantry, while the Battle of France was won with the decimation of the French air force, although the German air force did suffer losses at the hands of the RAF.

Only weeks before the Battle of Britain, the Luftwaffe had lost an estimated 28 per cent of its front-line combat force, with almost 1,500 planes having been destroyed. Balanced against that was the RAF's massive loss of 477 fighters from a total of 1,000 aircraft.

Despite previous successes, at Dunkirk the Luftwaffe were found wanting as its Stuka dive bombers proved ineffective against the moving naval vessels that had gathered to help evacuate the British Expeditionary Forces and French troops. The boats were protected by Spitfires and Hurricanes, which didn't help Göring's boast that

While targeting civilians wasn't an official Luftwaffe tactic, the 1935 Air War doctrine was unequivocal that fighters and bombers were to be used to destroy enemy forces and provide close air support to the army, which is exactly what happened when Germany invaded Poland to herald the start of the war in September 1939.

Udet, another World War I flying ace, was the Luftwaffe's technical chief, and he was a passionate advocate for the use of the Ju 87 Stuka because of its accuracy and ability to take out targets from close range. So it was no surprise when the war began with the wailing sirens of the Stukas descending on the Polish city of Wieluń to strike key targets, effectively becoming the Germans' flying artillery.

But it wasn't just the Stukas that contributed to the swift victory in Poland, in which the enemy air force was defeated in a fortnight. The twin-engined fighter

Messerschmitt Bf 110 also played a significant role as an escort and bomber intercept, winning scores of victories in the battle for aerial supremacy.

There was resistance from the Polish armies, most notably at the Bzura River, where the ensuing battle was won due to what historian E. R. Hooton described as an “awesome demonstration of air power”.

The Luftwaffe destroyed many bridges crossing the river, and the Stukas then dumped 50-kilogram (110-pound) bombs on the trapped Polish troops, before He 111 and Do 17 planes moved in with 100-kilogram (220-pound) explosives to finish off the job.

Without doubt, the Luftwaffe played an instrumental role in the victory in Poland, and the blitzkrieg strategy was then repeated with similar success in Norway, Denmark and across Holland, Belgium and France, which fell within six weeks.



The Waalhaven Airfield in Rotterdam was left in ruins by the Luftwaffe in May 1940

Image source: Getty Images



DUNKIRK: MIRACLE OR MESS?

DID THE LUFTWAFFE'S FAILURE TO PREVENT THE ALLIED EVACUATION AT DUNKIRK COST THE THIRD REICH THE WAR?

Of the Luftwaffe's major failings, perhaps the most notable and damaging was its inability to prevent the evacuation of British and French troops from Dunkirk.

There were many significant factors that contributed to the Luftwaffe's embarrassment, with internal disputes ranking highly among them. Göring was keen on allowing his bombers to finish off the trapped British troops, but Chief of Staff General Franz Halder was reluctant as the air force was drained from its campaign in the Battle of France. His fears were well founded.

The Luftwaffe was also unable to inflict any significant damage on the Royal Navy (only sinking six out of 41 destroyers and damaging 19) because it wasn't sufficiently equipped to deal with the RAF's Hurricanes and Spitfires that were protecting the ships.

Additionally, the weather conditions made sorties extremely difficult, with only two out of the 11 days reasonably clear, and after campaigns



A flotilla of small boats taking part in the Dunkirk evacuation

elsewhere in Europe the German air force was significantly depleted, with some squadrons only 50 per cent functional.

Another reason for the failure at Dunkirk It's is that front-line commanders were focused on events elsewhere. The Luftwaffe was needed to take Paris, and perhaps this was a bigger priority than destroying or capturing British troops.

Finally, it's been suggested that Hitler's objective at this time was to seek a favourable peace agreement with Britain, and annihilating the

surrounded troops at Dunkirk would've seriously jeopardised those plans.

As 338,000 Allied troops were able to flee to Britain, one British general noted, "I still cannot understand how it is that the Bosches [Germans] have allowed us to get the BEF off in this way. It is almost fantastic that we have been able to do it in the face of all the bombing and gunning."

With so many of these troops set to return to fight future battles, this proved to be a huge missed opportunity for the Luftwaffe and the Nazis.

"Only fishing boats are coming over for the British. Let's hope the Tommies can swim!"

There are many reasons for the German failure at Dunkirk, but the Luftwaffe's inability to carry out Göring's threats was certainly a huge turning point not only in the forthcoming Battle of Britain but in the overall outcome of the war itself.

Ten days after the 338,000 troops, who had been previously trapped at Dunkirk, were allowed to flee back to British shores, the Wehrmacht marched into Paris, seizing control of the city and setting the scene for a confrontation with newly elected Prime Minister Winston Churchill's Britain.

Operation Sealion was Hitler's plan for an amphibious invasion of England, but this would only be possible once the Luftwaffe had control of the skies over the English Channel, which would only be gained by decimating the RAF.

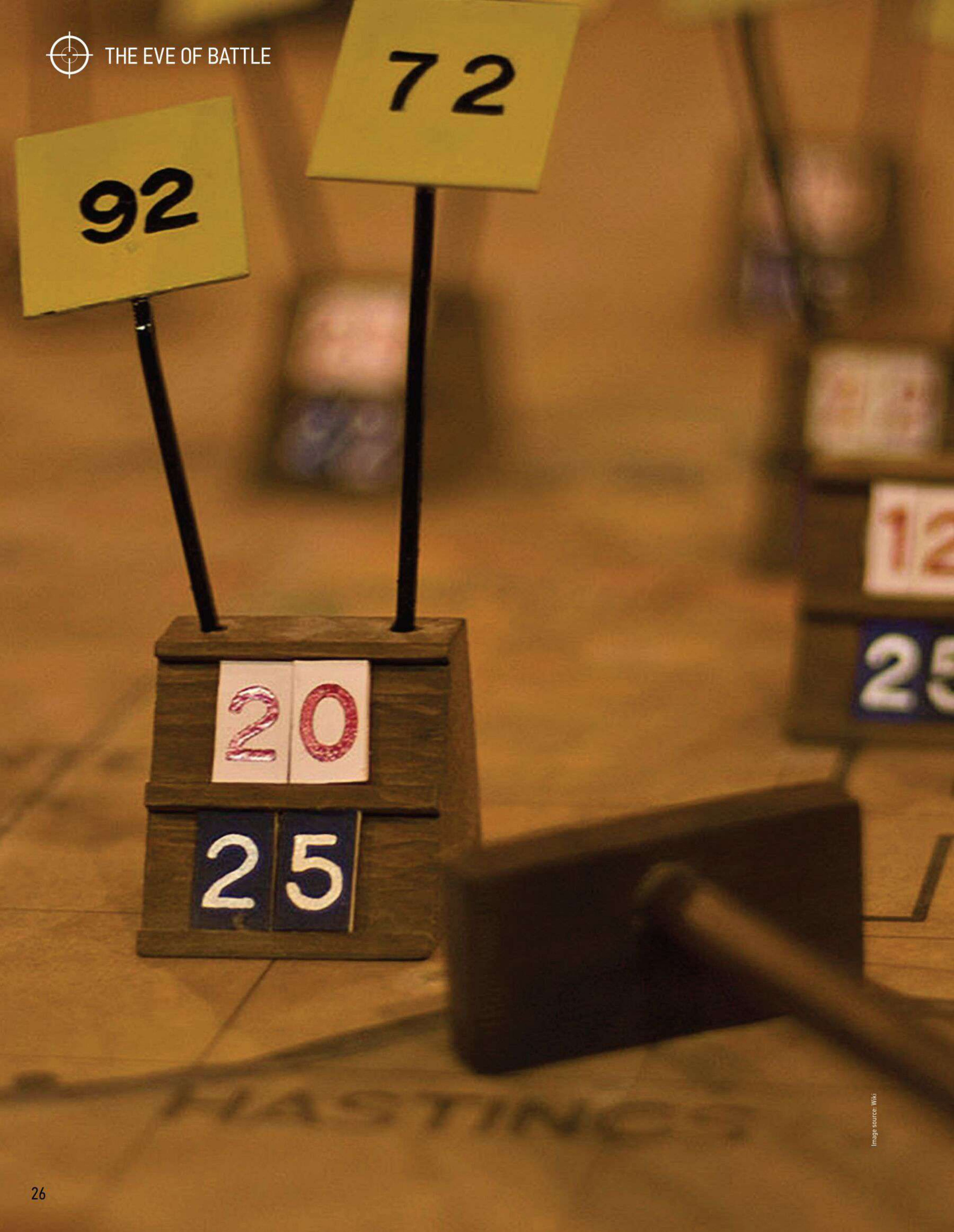
Despite the weaknesses that had been exposed by the Germans' overreliance on the Stukas, the Nazis decided the Luftwaffe could operate alone in inflicting enough damage on the RAF and Britain to the point that a land invasion could begin.

Hermann Göring was typically ebullient when accessing the coming clash: "My Luftwaffe is invincible. And so now we turn to England. How long will this one last – two, three weeks?"

With a combat air force far larger than the RAF's, the Luftwaffe's Commander-in-Chief had every reason to feel optimistic as the first German sorties headed towards Britain on 10 July 1940. Nobody had expected Germany to conquer Western Europe so rapidly, a campaign executed by an enormous war machine yet to taste defeat. Why would the battle against Britain result in anything other than a German triumph?



Adolf Hitler, Hermann Göring and General Heinz Guderian look over battle plans



THE INDOMITABLE DOWDING SYSTEM

WORDS MICHAEL E HASKEW

An air defence system developed in the 1930s enabled RAF fighters to win the Battle of Britain

The towers stood 240 feet high, ringing the eastern and southern coasts of England, their radio waves stretching across the Channel to occupied France. Chain Home, as it was called, employed the world's first operational radar, then known as RDF (radio direction finding), to warn of approaching Luftwaffe air raids during the difficult spring and summer of 1940.

In those dark days, the Nazi wolf was literally at England's door. However, Operation Sealion, the invasion of Britain, could not proceed with certainty until Marshal Hermann Göring's Luftwaffe owned the skies. The fate of the British Empire was decided in the air as Royal Air Force fighter pilots rose to meet the enemy time after time, shooting down so many swastika-emblazoned aircraft that the threat of invasion was extinguished.

Truly, much was owed to the fabled 'Few'. But just as much was owed to one man and his prescience, which led to the development of the world's first integrated air defence system. Air Chief Marshal Sir Hugh Dowding, leader of RAF Fighter Command, recognised as early as the mid-1930s that emerging technology might be coupled with an extensive observation and anti-aircraft ground network to stand against a future Luftwaffe enemy that would outnumber RAF planes more than four to one with the onset of the Battle of Britain.

Members of the Royal Observer Corps scan the sky, tracking a German air raid



Image source: Wiki

Formidable force multiplier

Dowding foresaw the need for a force multiplier that would allow the RAF to fend off Luftwaffe air raids with economy of force, sending fighters directly towards incoming enemy aircraft with accuracy. Such a system would curb the need for standing patrols, which would erode RAF combat efficiency, exacerbate the loss of precious resources such as fuel, planes and pilots, and rely heavily on visual contact to identify emerging threats.

The task was daunting, and at times frustrating. During one exercise intended to detect an incoming raid the system failed miserably, and Dowding learned of the approaching planes only when he heard the drone of their engines.

Nevertheless, Dowding and his associates persisted, developing a sophisticated system of early warning that would come to bear his name. The Dowding System may justly be credited with the comprehensive information gathering and dissemination that did, in fact, allow Fighter Command to defeat the Luftwaffe. During the interwar years, when conventional methods were used, mock air raids were successfully intercepted by RAF fighters only half the time at best. During the Battle of Britain, however, the Dowding System proved its worth as successful interceptions soared above 90 per cent.

In addition to Chain Home, Fighter Command constructed an elaborate network to gather, analyse and distribute data on incoming Luftwaffe raids in real time. British air defence was divided into four sectors: 10 Group under Air Vice Marshal Sir Quintin Brand was responsible for Wales and the South West; 11 Group, led by Air Vice Marshal Keith Park, covered London and the South East; 12 Group under Air Vice Marshal Trafford Leigh-Mallory was responsible for part of northern England, East Anglia and the industrial Midlands; and 13 Group, led by Air Vice Marshal



The Chain Home tower at RAF Stenigot stands against the clouds

Image source: Wiki © David Wright

Richard Saul, covered Northern Ireland, parts of northern England and southern Scotland. Each of these groups was divided into sectors, their main airfields designated 'Sector Stations' with huts constructed to house an operations room where personnel would direct fighters on courses to intercept enemy planes.

The sequence of events began with Chain Home, its 241-kilometre (150-mile) reach detecting aircraft flying from 1,000 to 30,000 feet. Telephone operators, or tellers, at these RDF stations (56 of which were operational by the end of the Battle of Britain) transmitted their information, including range, bearing, speed and estimated number, to the Filter Room at Fighter Command Headquarters, Bentley Priory, Stanmore, Middlesex. At Bentley Priory the pieces were put together by teams that organised a comprehensive perspective on the coming Luftwaffe attacks. Tellers passed the information from the Filter



Nicknamed 'Stuffy', Sir Hugh Dowding served the RAF from 1918 to 1942



Air Chief Marshal Sir Hugh Dowding walks beside the king and queen in September 1940

Room to the underground Operations Room and simultaneously to the affected groups and sectors, where more operations rooms buzzed with activity.

The raids were tracked on large maps as blocks and arrows indicated the direction of incoming planes as well as the RAF squadrons scrambling from the airfields. At each level from Fighter Command to group to sector the maps became more specific, focused on the area of responsibility. At Fighter Command Headquarters the officers on duty could direct a coordinated effort against multiple threats while looking at the changing maps from a gallery above the pit, where plotters were continually updating the situation using rods to move the blocks across the maps.

At group level, a controller performed the critical function of discerning where to concentrate the available fighters under his supervision as sector commanders were notified by telephone. Sector controllers then ordered individual airfields to scramble, sending pilots rushing towards their cockpits. Within minutes, RAF fighters were airborne and vectored onto their target. They were further tracked utilising new receiver and transponder technology called 'huff-duff' and 'pip-squeak'. Many of the personnel working diligently at each level were members of the WAAF (Women's Auxiliary Air Force).

Although effective, Chain Home was unable to reliably detect incoming aircraft flying below 1,000 feet. Therefore, a supplemental network of 30 smaller stations, dubbed Chain Low, were built on high ground beginning in 1939. In addition, the Royal Observer Corps pitched in as Luftwaffe planes crossed the coastline, watching and reporting back to the stations as raiders flew

overhead. Fighter Command also controlled the anti-aircraft units, searchlights and barrage balloons of RAF Balloon Command.

The pivotal air defence programme

The Dowding System proved a remarkable success. As the Battle of Britain progressed, German airmen reported with increasing alarm that British fighters always seemed to know where they were. Although they were aware of the British use of RDF, the Germans failed to fully comprehend its ability to shape the outcome of the critical battle raging above Britain from July to October 1940. Direct attacks on Chain Home sites inflicted some damage and actually destroyed the Ventnor station on the Isle of Wight, creating a temporary 16-kilometre (ten-mile) blind spot in the network. Göring, most likely unaware of it, failed to exploit the opportunity.

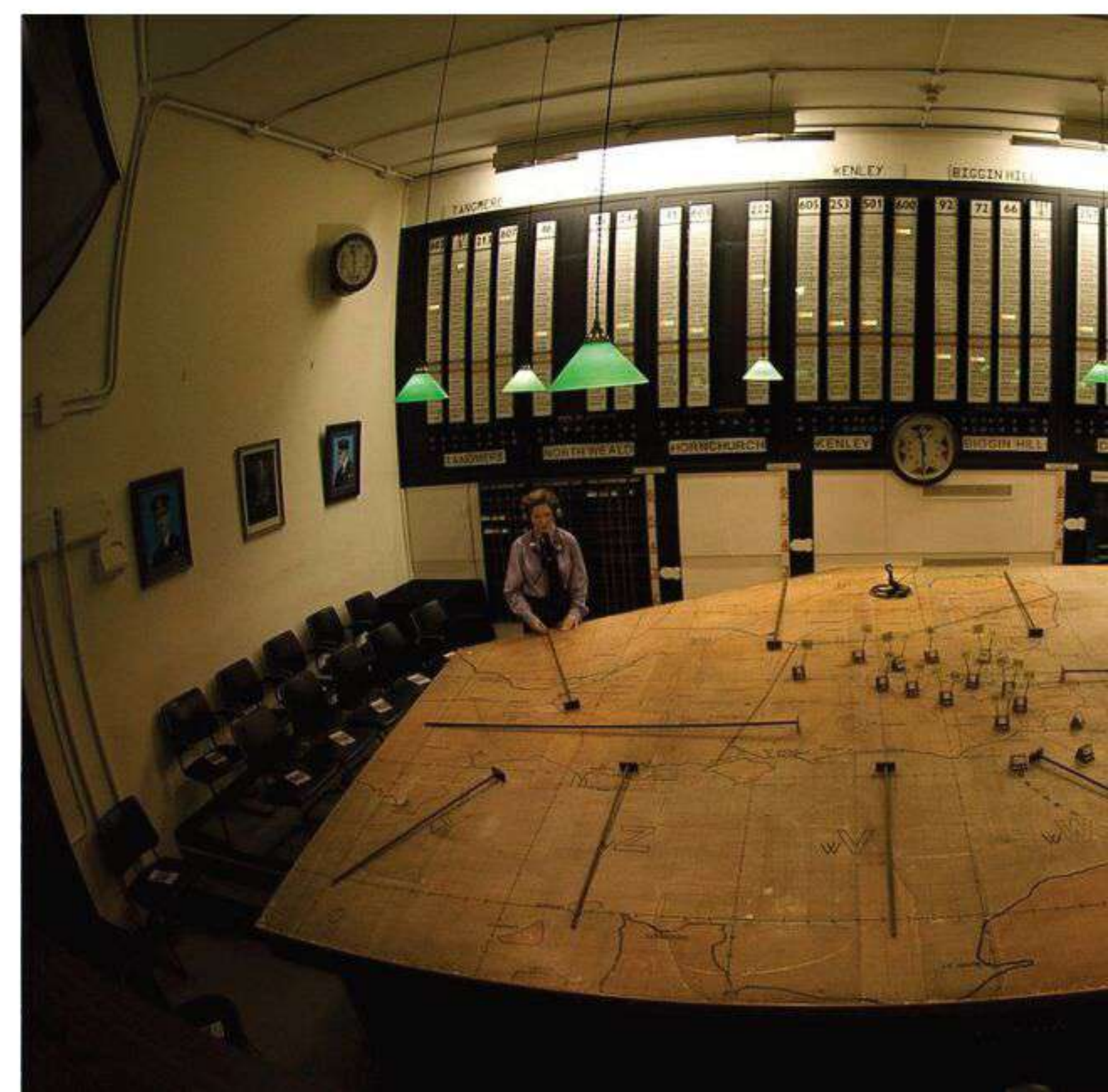
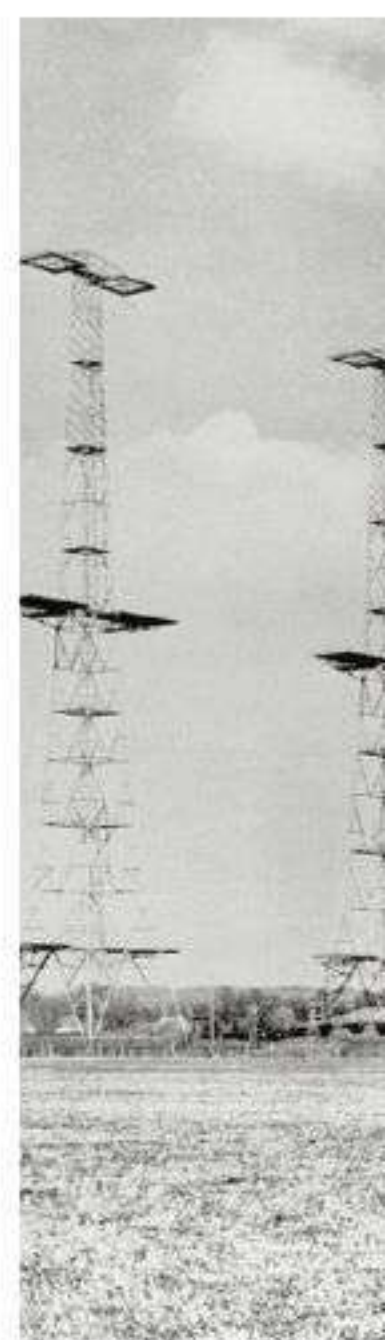
Raids against airfields, where sector operations rooms were initially located, caused numerous casualties among the skilled operators and plotters, particularly at RAF Biggin Hill, prompting the relocation of some centres away from such installations. Relief came when the Luftwaffe switched tactics and undertook the terror bombing of London and other cities, allowing the RAF to make good grievous losses during a critical period in the Battle of Britain.

Conversely, although 11 Group bore the lion's share of defence against the Luftwaffe air assaults, action by 13 Group on 15 August 1940 illustrates the power of the Dowding System well. Two Luftwaffe raids launched from airfields in Denmark and Norway and intended to strike manufacturing facilities from northern Yorkshire to Tynemouth were tracked for at least an hour as

they flew across the North Sea. RAF fighter pilots scrambled, reached high altitude with the Sun to their backs and fell upon the enemy formations. Without loss, the RAF fighters scattered the formations and shot down many German planes.

Assessing the success of the Dowding System in his acclaimed *The Second World War* series of books, Prime Minister Winston Churchill wrote in 1949, "All the ascendancy of the Hurricanes and Spitfires would have been fruitless but for this system which had been devised and built before the war. It had been shaped and refined in constant action, and all was now fused together into the most elaborate instrument of war, the like of which existed nowhere in the world."

Indeed, Air Chief Marshal Sir Hugh Dowding had championed the prototype of future air defence systems, and its legacy survives today.





THE BATTLE OF BRITAIN

IN 1940 THE LUFTWAFFE ATTEMPTED TO DESTROY THE RAF, BUT BRITAIN WAS READY WITH SEVERAL DEFENSIVE MEASURES

RADAR

A network of radar towers called Chain Home lined Britain's coastline, detecting and reporting enemy aircraft up to around 241km (150mi) away.

FIGHTER GROUPS

The defence of Britain was split into four sections – Fighter Groups 10 to 13. Group 11 was the largest and bore the brunt of Luftwaffe attacks.

ANTI-AIRCRAFT ARTILLERY

Fighter groups controlled all anti-aircraft batteries and barrage balloons in their area, co-ordinating to engage enemy formations effectively.

DOWDING SYSTEM

Incoming enemy numbers and locations would be reported to Fighter Command HQ, which would direct the relevant Fighter Group to scramble pilots in that area.


DOGFIGHTING TACTICS

Pilots on both sides used the glare of the Sun and cloud cover to conceal their approach, and diving attacks from higher altitudes caught the enemy off guard.

The 11 Group operations room has been preserved in its wartime state

Image source: Getty





DEATH FROM ON HIGH

Due to the numbers involved, the Battle of Britain was always set to be one of attrition. From July to October of 1940, courageous men and women would perish by the hundreds as Germany pushed to extinguish the last flame of resistance to the Third Reich



WHEN WAS THE BATTLE OF BRITAIN?

On 18 June 1940, Winston Churchill told the House of Commons, “What General Weygand called the Battle of France is over. I expect that the Battle of Britain is about to begin.” But just when did that momentous battle begin and end? Andy Saunders discusses why the answer may not be straightforward

During the latter half of 1941 the Air Ministry published a small HMSO booklet called *The Battle Of Britain – August To October 1940*. Here, for the first time, was an authorised narrative that also set the dates of the battle, stating authoritatively that it had commenced on 8 August with the launch of sustained air attacks. However, if the Air Ministry believed the Battle of Britain began on 8 August and ended on 31 October, why is it now officially marked as commencing on 10 July?

The truth of the matter is that the ‘battle’, per se, was an entirely artificial affair, with its date parameters set by the British. In any event, the German view was that there was no such thing as the Battle of Britain. Instead, the fighting in the summer of 1940 was part of continuing air operations against Britain, commencing in October 1939 and continuing, in different phases, for the duration of the war. And they had a point.

Of course, given Churchill’s speech on 18 June, pronouncing “...the Battle of Britain is about to begin”, one must reasonably assume that its commencement was considered to have been soon thereafter. Certainly, Air Ministry officials compiling the 1941 booklet must have looked retrospectively at the air fighting over Britain in 1940 and concluded that it all began on 8 August. And there was logic to selecting that day – the date that saw the heaviest air fighting of the war so far. So why, and when, did the battle’s commencement get moved to 10 July?

Some months after relinquishing command, the former commander-in-chief of RAF Fighter Command, Air Chief Marshal Sir Hugh Dowding, was invited by the Secretary of State for Air to write a dispatch on the Battle of Britain, and the finished work was submitted on 20 August 1941. By this stage, however, the Air Ministry account had already been published, and in the preamble to his dispatch Dowding acknowledged that fact. However, his dispatch was eventually published in the *London Gazette* on 11 September 1946, setting in stone what became the battle’s ‘official’ dates. But what Dowding had to say on the matter is both interesting and revealing.

“It is difficult to fix the exact date on which the ‘Battle of Britain’ can be said to have begun.

“THE ‘BATTLE’, PER SE, WAS AN ENTIRELY ARTIFICIAL AFFAIR, WITH ITS DATE PARAMETERS SET BY THE BRITISH. IN ANY EVENT, THE GERMAN VIEW WAS THAT THERE WAS NO SUCH THING AS THE BATTLE OF BRITAIN”

Operations of various kinds merged into one another almost insensibly, and there are grounds for choosing the date of 8 August, on which was made the first attack in force against laid objectives in this country, as the beginning.”

Dowding then went on to discuss the rationale for his selection of dates, pointing out the varied Luftwaffe attacks against Channel convoys during July as probably constituting “the beginning of the German offensive”. Ultimately, he settled on a commencement date: “I have therefore, somewhat arbitrarily, chosen the events of the 10 July as the opening of the battle. Although many attacks had previously been made on convoys, and even on land objectives such as Portland, the 10 July saw the employment by the Germans of the first really big formation (70 aircraft) intended to bring our Fighter Defence to battle on a large scale.”

The opening date was set. However, Dowding’s passing mention of an attack on Portland is significant. In my opinion, the Portland attack on 4 July would have been a far more appropriate date to select for the Battle of Britain’s commencement. The truth of the matter, however, was that selecting this particular date would have been difficult for Dowding to countenance.

On 4 July 1940, Junkers Ju 87 ‘Stukas’ launched an attack against Royal Navy installations at Portland, specifically targeting HMS Foylebank. During a devastating attack, Foylebank (ironically an anti-aircraft ship) was sunk, killing 176 of the ship’s company. On board, Able Seaman Jack Mantle battled valiantly at his gun but was mortally wounded, earning a posthumous Victoria Cross. However, he was one of very few defenders and, in

fact, RAF Fighter Command didn’t manage to get a single aircraft airborne.

Adding to the debacle, an ‘Outbound Atlantic’ convoy was also attacked in the Channel. Furious, Admiral Max Horton called it all “a disgraceful episode” as he railed against the lack of air cover. Meanwhile, Churchill issued an ‘Action This Day’ memo demanding assurances “that Air [the RAF] is contributing effectively”.

Unfortunately, there had been failings of the Chain Home radar coverage coupled with confusion about returning British aircraft, and this resulted in Fighter Command’s failure to get off the ground. Under the circumstances, albeit that the radar network was not part of Dowding’s command, it would have been difficult for him to have selected 4 July, despite the fact that Luftwaffe action that day more pointedly indicates this as a more definitive start date than any other. After all, he could hardly single this out as the start date when RAF fighters were not involved. Whether or not Fighter Command participated, it was certainly a more significant day of action than the lacklustre and desultory affair that took place on 10 July.

On such arbitrary dates, then, was the Battle of Britain officially declared to have been fought. Even its ‘end date’ of 31 October is subjective, bearing little relation to what was happening in the air.

By a stroke of Dowding’s pen, Squadron Leader ‘Archie’ McKellar (killed on 1 November when his plane was shot down) was not deemed a casualty of the Battle of Britain on Westminster Abbey’s Roll of Honour. Squadron Leader George Lott, shot down and blinded in one eye on 9 July, was denied a place as one of ‘the Few’ by a matter of hours. In an interview in 1979, Lott remarked, “Nobody had told the bloody Germans that the Battle of Britain hadn’t started yet!”



ANDY SAUNDERS

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British children shelter in a trench in Kent, 1940





DEATH FROM ON HIGH

THE DOGFIGHT BEGINS

WORDS EDOARDO ALBERT

Master of Europe, only one thing stood between Hitler and total control of the continent: the RAF

There are very few battles that are named before being fought, but the battle over the skies of Britain in the summer and autumn of 1940 was one of them. On 18 June 1940, Winston Churchill, who had been Prime Minister for just over a month, gave a speech to the House of Commons in response to the calamitous events in France. Seeing the collapse of French resistance, Churchill warned the House that “the Battle of France is over. I expect that the Battle of Britain is about to begin. Upon this battle depends the survival of Christian civilisation.”

He was right. But, unusually perhaps, the other participant in the battle did not expect to have to fight it. Adolf Hitler was convinced that, faced with the defeat of their French allies and the overwhelming success achieved by the German armed forces, the British would sue for peace. Since the Führer was sure of this, the German military had devoted very little thought to what to do if the British did not want peace. While the Wehrmacht and Kriegsmarine worked on the plan that would become Operation Sealion, on 30 June Hermann Göring, Reichsmarschall and



commander of the Luftwaffe, ordered his planes to begin the air war against Britain. The German High Command agreed that a necessary prerequisite for a seaborne invasion of Britain would be air superiority; securing it would deny the Royal Air Force the opportunity to attack the vulnerable landing craft that would ferry the German Army across the Channel and give the Luftwaffe a free hand to destroy the Royal Navy as it sought to turn back the invasion. The orders in Göring's General Directive mandated small-scale bomber raids escorted by fighters on the British mainland, while the main immediate effort was to attack shipping in the Channel, closing it off to the Royal Navy. These probing attacks served to familiarise German air crews with the navigation and geography involved while allowing the Luftwaffe to test the strengths and weaknesses of the RAF and give exhausted air men the chance to rest.

For the RAF, and its commander, Air Chief Marshal Hugh Dowding, the chief concern was

The perfect weather of summer 1940 meant that civilians on the ground followed the battle as closely as the men fighting in the sky above



Image source: Getty Images



"Scramble!" The RAF pilots of 601 Squadron, based at Tangmere, run to their waiting Hurricanes. Victory often went to those who had the height: the quicker they could take off and the higher they could get, the better their chances

Image source: Getty Images



DEATH FROM ON HIGH

Few deadly weapons have been as beautiful and elegant as the Supermarine Spitfire



'SAILOR' IN THE SKY

RAF ACE 'SAILOR' MALAN TRANSFORMED THE RAF'S TACTICS DURING AND AFTER THE BATTLE OF BRITAIN

It's perhaps not surprising that Adolph Malan was better known by his nickname 'Sailor', which he had acquired from a maritime career brought to an end by the Great Depression. Turning to flying, the South African enlisted in the RAF in 1936 and was quickly recognised as an outstanding officer. Malan took part in the Battle of France, his squadron helping to provide cover for the retreating British forces, with Malan himself chalking up three victories.

Back in Britain, Malan was heavily engaged in the fighting over the Channel in July, claiming further victories, and he was promoted to the

command of 74 Squadron on 8 August. At 30, Malan was older than most of his pilots and brought a calm analysis to RAF tactics: in particular, he abandoned the tight, three-aircraft flying V formation for the 'finger-four' formation, which afforded far more flexibility.

In addition, Malan compiled ten rules for air fighting that quickly circulated through the RAF, providing new pilots with a basic tactical awareness for the battles ahead. Of the ten, perhaps the most often repeated for rookies was number 7: never fly straight and level for more than 30 seconds in the combat area. Malan's rules became the bible for training RAF pilots.

Suffering combat weariness, Malan was transferred to flight training in July 1941 where he passed on his skills to the next generation of pilots. He ended the war with 32 confirmed victories and returned to South Africa, becoming an active opponent of Apartheid. He died in 1963 at the age of 53 from Parkinson's disease.

"MALAN'S TEN RULES OF AIR FIGHTING BECAME THE BIBLE FOR TRAINING RAF PILOTS"



'Sailor' Malan sitting in the cockpit of his Spitfire at RAF Biggin Hill

Image source: Wiki

“GÖRING INSISTED THAT GERMAN FIGHTER PLANES BE USED OFFENSIVELY TO SEEK AND DESTROY RAF FIGHTERS, RATHER THAN AS ESCORTS FOR BOMBING MISSIONS”



Image source: Getty Images

the numbers: the Germans had substantially more planes than the RAF. It was clear that, for all the individual heroics, this would be a battle of attrition: victory would go to the side that could bleed the enemy of its pilots and planes quicker. In that, the RAF started at an obvious disadvantage as the Germans began the battle with more pilots. However, Dowding had created an integrated defence system that coordinated early warnings from the string of radar stations along the coast with the reports from the Observer Corps, sending these via telephone to the sector Stations, which plotted the incoming attacks on a large table with wooden blocks indicating the estimated strength of the raid while arrows showed the direction of flight. On a balcony overlooking the operations table was a group of about eight men, including the Senior Controller, responsible for issuing orders to the waiting RAF squadrons, directing them to intercept the incoming German attacks.

The official date for the start of the Battle of Britain is 10 July. For four long days, the RAF and the Luftwaffe engaged in bitter aerial battles over the Channel and the coast of Britain as formations of battle-hardened and confident German fighter pilots sought to sweep the RAF from the air. Attacks were mounted on convoys, ports and aircraft factories by German bomber formations while fighter groups sought to destroy the British

fighters meeting these attacks. With many of these dogfights taking place over water, a lot depended on the efficiency of air-sea rescue to pick up pilots who had bailed out. In this, the Germans had a distinct advantage, with dedicated sea planes patrolling for downed aircraftmen that were able to land on the water and rescue survivors: the RAF relied on passing sea traffic to find and fish out their pilots and, as a result, many men who might otherwise have survived were lost. Overall, though, during these four days of intense combat, the RAF lost 29 fighters while the Luftwaffe had 40 planes shot down. But that was not what the respective air forces thought at the time.

In the heat of battle, it was easy for a pilot to see oil and smoke trailing from his target and, with the plane heading downwards, to claim the target as a confirmed kill and turn away to stop himself becoming a target too, only for the pilot to regain control of his stricken plane and nurse it home. The result was that both sides grossly overestimated the number of enemy planes their pilots had shot down. This had a profound effect on the psychology of the battle because it fed into the estimates of the enemy strength each side had.

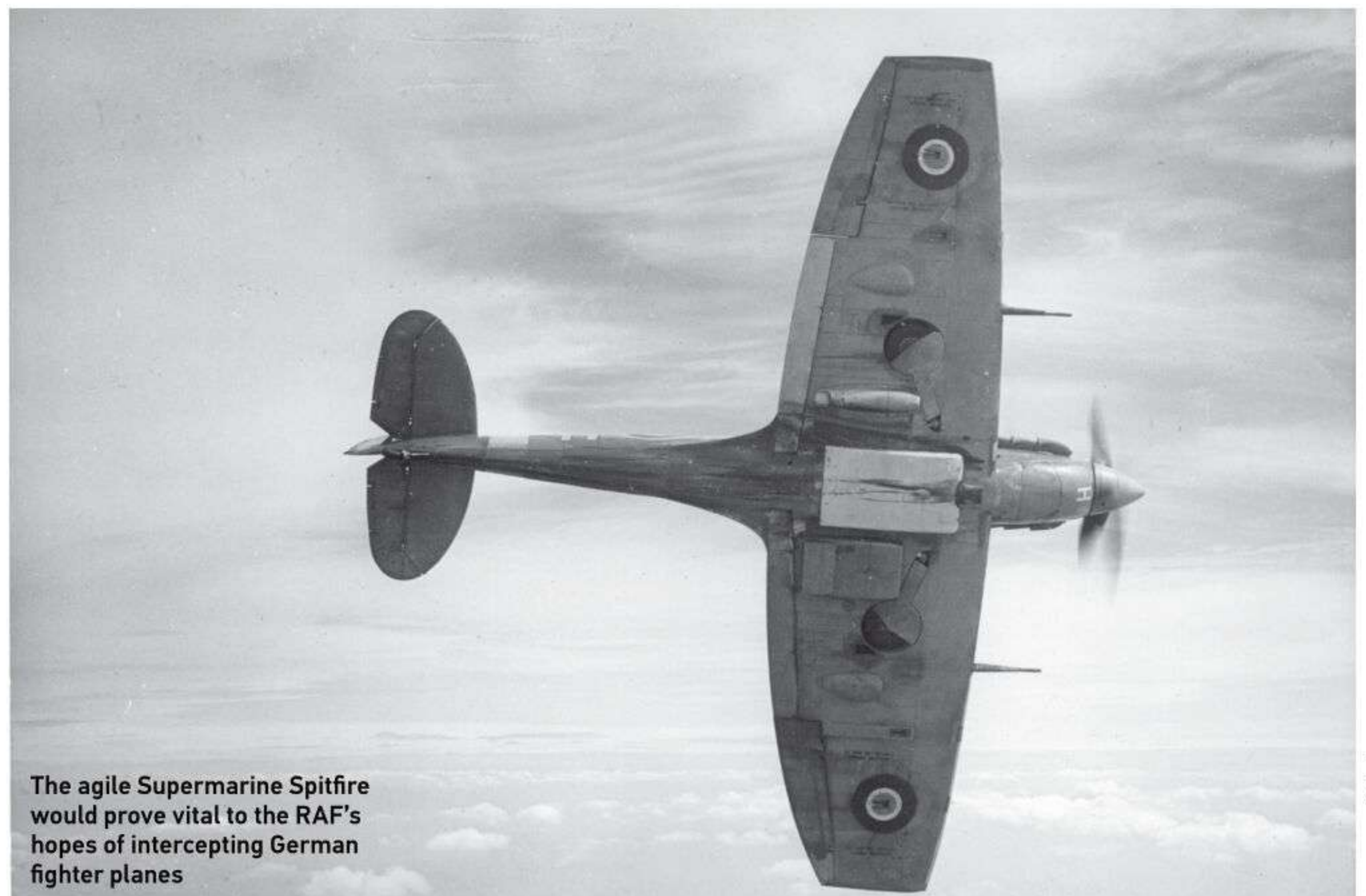
German intelligence had underestimated the initial strength of the RAF. When this belief in the paucity of forces commanded by the RAF was coupled with overestimates of the number of RAF planes they had shot down, the Luftwaffe commanders became initially convinced that victory was very near only to be confounded when the RAF continued to send squadrons up to intercept their attacks: according to German intelligence, the RAF should by that stage have been down to just a handful of planes. The British had better initial estimates of Luftwaffe strength plus the incalculable benefit of having cracked the German 'Enigma' code, thus allowing the code-

breakers at Bletchley Park to read encrypted German messages. While analysis has shown that this had little operational effect on the outcome of the Battle of Britain, it afforded the British a better idea of German intentions and strength.

By 16 July Hitler had realised that the British were not going to negotiate a peace treaty. He duly issued Directive 16, ordering his military high command to prepare for the invasion of Britain. The directive had four preconditions, the most important being that the RAF be rendered incapable of opposing the invasion. In response, Hermann Göring ordered his commanders to prepare for Adlerangriff ('Eagle Attack'), an air offensive designed to sweep the RAF from the sky. To facilitate this, Göring insisted that German fighter planes, the Bf 109 and twin-engined Bf 110, be used offensively to seek and destroy RAF fighters, rather than as escorts for bombing missions. Little did the Reichsmarschall realise that some of his most trusted commanders would not follow this order, preferring to use the fighter planes to escort the vulnerable bombers, with fatal results for the German offensive.

The Luftwaffe gradually intensified its attacks in the days leading up to Adlerangriff, which was scheduled for 10 August. Both sides were learning rapidly. The RAF, which had early on relied on very tight fighter formations, with the planes' wings almost touching, realised that the looser formations used by the Luftwaffe were far superior, allowing the pilots to support each other while not requiring them to remain so focused on not hitting the plane next to them as to make it difficult to maintain awareness of 'bandits' lurking above: in a dogfight, the plane that had the altitude had a huge advantage.

The RAF's tactical doctrine was for the more nimble and faster Spitfires to engage



The agile Supermarine Spitfire would prove vital to the RAF's hopes of intercepting German fighter planes

Image source: Getty Images



“IN THE METAL-STREAKED SKIES OVER BRITAIN, ONE MOMENT OF HESITATION COULD BE A PILOT’S LAST”



the Luftwaffe fighter planes while the more heavily armed Hurricanes broke up the bomber formations. In practice, this rarely worked to plan. Meanwhile, the Luftwaffe was starting to realise the importance of the string of radar stations along the south coast. The first wave of attacks on Adlerangriff were to be aimed at these radar stations before moving inland and attacking RAF bases and command stations: the strategy was aimed at luring the RAF into a battle it had no choice but to fight and destroying it in the skies above southern England. With the inherent advantage the RAF had of fighting over home ground (pilots who baled out could be flying again the same day, whereas German pilots found

themselves prisoners for the rest of the war) it was the strategy most likely to achieve Göring’s aim of destroying the RAF.

Adlerangriff was delayed by bad weather until 13 August. Adlertag (‘Eagle Day’) followed the first attempt, on 12 August, to knock out RAF radar stations; the tall iron towers proved largely impervious to bombs but the Luftwaffe High Command did not realise that attacks on the infrastructure – power lines, telephone cables – that allowed the radar stations to operate could have put them out of action. But as the German strategy was to lure the RAF into combat, it was thought that there was little operational reason to continue the attacks. The hammer, instead, fell on the air fields of 11 Group, commanded by Air Chief Marshal Keith Park, which was responsible for the defence of southeast England and London and, as such, bore the brunt of Luftwaffe attacks. Park, a New Zealander, was in command of the day-to-day – indeed hour-by-hour – defence of the country, coordinating 11 Group’s response from the Group Operations Room at RAF Uxbridge.

On 15 August the Luftwaffe launched the most attacks of the entire battle; thinking the RAF was entirely committed to the defence of the South East, German planes attacked the north of England only to be shot down in large numbers. In fact, Dowding and Park had a policy of rotating squadrons to quieter sectors to rest and regroup: these resting squadrons administered such serious losses to Luftflotte 5 that it took no further serious part in the battle. But among all the killing there was still room for acts of mercy.

German bomber ace Joachim Helbig, flying a Junkers 88, had

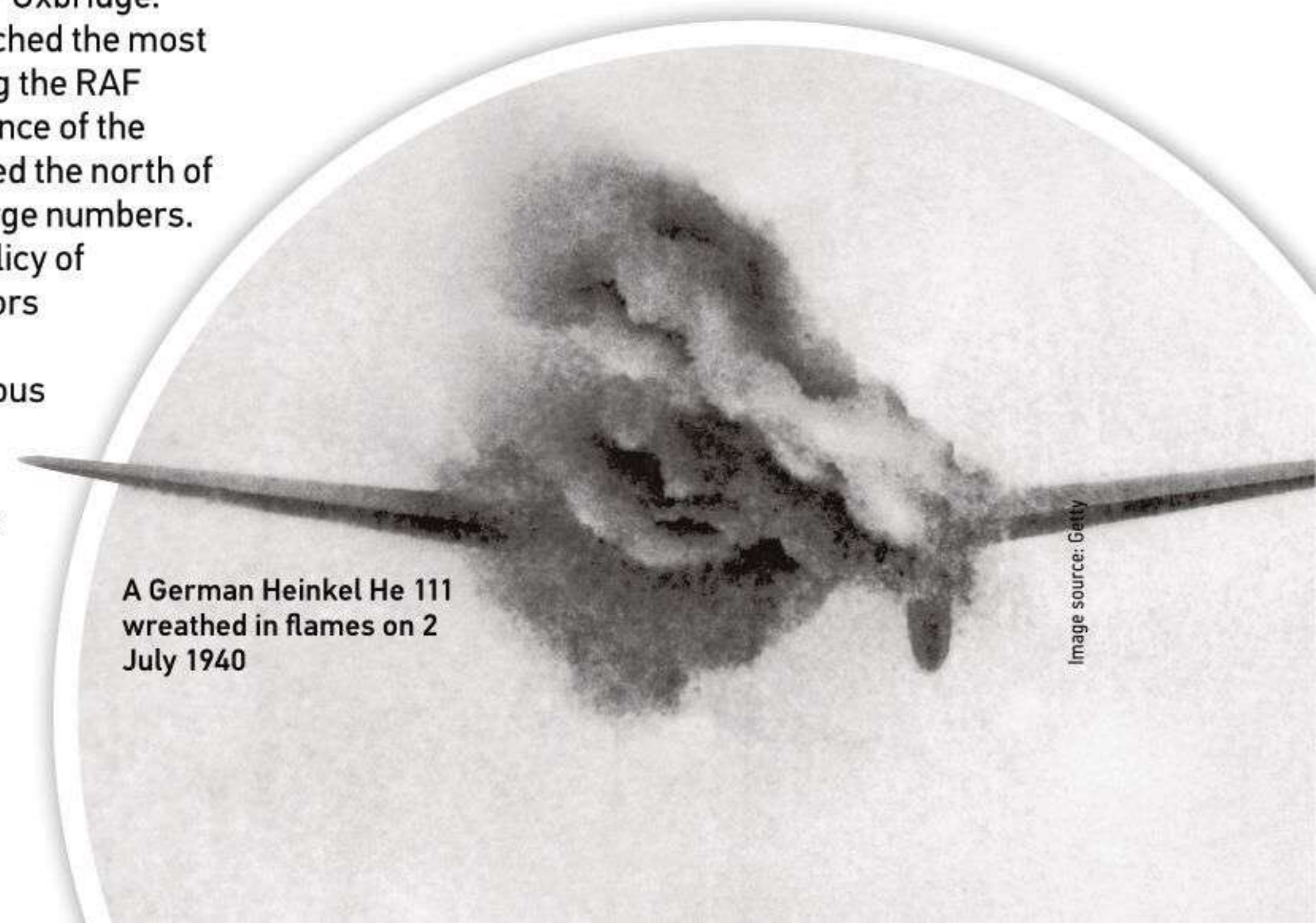
his plane badly shot up by a Hurricane flown by Pilot Officer Gordon Cleaver, only for his gunner, Franz Schlund, to take out the Hurricane as it was closing in for the kill. Cleaver baled out and landed near Winchester; his eyes seriously damaged by Perspex shards from his shattered cockpit, Cleaver retired from flying. As for Helbig and his Ju 88, the plane was badly shot up and two of the four-man crew seriously injured; could he nurse the plane back to base? Then, almost miraculously, the sky seemed to suddenly clear of all aircraft. Sensing an opportunity, Helbig turned his plane south, beginning to relax once they were over the Channel.

“Spitfire!” The warning came from rear-gunner Schlund, but with his ammunition exhausted there was nothing he could do. Helbig tried to lose the Spitfire but could not shake the faster and more manoeuvrable fighter. Resigned to their fate, Helbig and his crew waited for the rattle of bullets. It never came. Instead the Spitfire drew up alongside them, its pilot looking in at the enemy.

The crew of a Bf 110 downed in the Channel evacuate the aircraft before it sinks. German air-sea rescue was significantly superior to that of the RAF, with dedicated sea planes able to land and pick up downed airmen from the water



A German Heinkel He 111 wreathed in flames on 2 July 1940





The formidable Messerschmitt Bf 109. There was very little to choose between the 109 and the Supermarine Spitfire: it usually came down to pilot skill and luck

Image source: Getty

Amazingly, the Spitfire proceeded to escort Helbig's plane back across the Channel. Then, with the coast approaching, the pilot waved a salute and turned away, allowing a relieved Helbig to nurse his crippled plane back to base. He never discovered the identity of the merciful pilot who chose to spare a hopelessly exposed enemy.

Such acts of kindness, while heartening, were indeed rare. In the metal-streaked skies over Britain, one moment of hesitation could be a pilot's last. As Helbig's plane stuttered its way back to France, further bloodshed loomed on the horizon.

Adlerangriff culminated on 18 August with a day of attrition for both sides in which the RAF and Luftwaffe suffered the most single-day casualties of the campaign – and both sides again completely overestimated how many enemy aircraft they had destroyed while under reporting their own losses. RAF losses were, in fact, 30 planes with ten pilots killed, while the Luftwaffe lost 71 planes with over 90 aircrew killed and 40 captured.

The weather then intervened, stopping large-scale action for a week and allowing the two commands to assess the outcome of the last few days of battle. The analysis was galling for Göring; his Ju 87 Stuka dive bombers had suffered such severe losses that they were withdrawn from the battle. Since 8 August, the Luftwaffe had lost nearly 350 planes; far more damage than he had expected the RAF to be able to inflict. The battle was not going as planned.

Committed to his strategy to draw RAF fighters into the air so that his planes could shoot them down, on 23 August Göring ordered attacks on aircraft factories and RAF facilities. A wave of planes targeted Park's 11 Group airfields, knocking several out of action for a while; RAF Manston, on the tip of Kent, was particularly badly



THE BATTLE OF THE CHANNEL

THE FIRST PHASE OF THE BATTLE OF BRITAIN TOOK PLACE OVER THE COLD WATERS OF THE ENGLISH CHANNEL

Following the Luftwaffe's first exploratory raids, what became known as the 'Channel Offensive' began at the beginning of July. It enjoyed immediate success: attacks on the 14-ship convoy OA 178 sank four vessels and seriously damaged five more without German loss. The notorious Junkers Ju 87 Stuka dive bombers proved particularly effective against shipping with their precision bomb delivery. As a result of this and other attacks, the admiralty directed most convoys around the north of Scotland rather than risking 'bomb alley' along the Channel.

However, Churchill was not willing to cede the Channel to the Germans and requested that Dowding provide fighter cover for any convoy making its way through the narrow channel. The skirmishes between the RAF and the Luftwaffe

were furious and deadly: one particularly memorable encounter saw New Zealander Alan Deere of 54 Squadron playing a deadly game of chicken with a Bf 109. Neither pilot would turn away – thus exposing his plane to raking fire from the enemy – with the result that the two planes hit each other. The propeller and cockpit of Deere's Spitfire were struck by the passing Messerschmitt and his engine failed. But Deere managed to glide back to the RAF base at Manston where he crash-landed. His plane then caught fire, but Deere broke free from his cockpit and escaped with only minor burns.

Credited with 22 kills by the end of the war, Deere was shot down on nine occasions but survived each time, clambering back into a new plane and continuing the fight.



Alan Deere (far right) talks to his station commander, 'Sailor' Malan, (left) at RAF Biggin Hill in 1943. By this stage of the war Deere was a wing leader, commanding RAF patrols deep into enemy-held Europe and providing fighter cover for bombing missions

Image source: Wiki

hit. Dowding's integrated control structure began to creak, and by the end of August Göring's tactics of sending huge numbers of fighters in continuous waves was starting to pay off.


To offset its losses, the RAF called up replacement pilots from the Fleet Air Arm and emigré squadrons of Poles and Czechs, among them the Poles of 303 Squadron. On 30 August, the pilots of the squadron were training with their British squadron leader when Pilot Officer Ludwik Paszkiewicz, seeing action in the distance, set off to join in, shooting down a German plane. He later claimed that his radio set was not working, which was why he had not obeyed his squadron leader's order to return.

The next day 303 Squadron went into action, and their courageous contribution to the battle would be needed in the brutal days and weeks ahead. Göring, with his reputation on the line, not to mention victory, was determined to crush the RAF once and for all. The struggle for Britain's skies was far from over.

Reichsmarschall Hermann Göring was far from being the buffoon portrayed in films. If his subordinates had followed his strategy more closely and Hitler not insisted on moving the focus of the attack to London, he might have succeeded in destroying the RAF



Image source: Getty



**RAF AIR GUNNER COLIN DOUGLAS
TAKES AIM IN AN AVRO ANSON
RECONNAISSANCE PLANE DURING
TRAINING WITH 52 SQUADRON IN
BENSON, OXFORDSHIRE. A TWIN-
ENGINE MONOPLANE, THE AVRO
WAS EQUIPPED WITH A 303-CALIBRE
VICKERS MACHINE GUN AND WIDELY
USED FOR TRAINING PILOTS.**





DEATH FROM ON HIGH

THE FORGOTTEN MANY

WORDS **STUART HADAWAY**

‘The Few’ may have won the Battle of Britain, but they were just the tip of a vast machine. Hundreds of thousands of personnel on the ground made their every move possible

First, let us get one thing straight: the Royal Air Force won the Battle of Britain. It is true that many other organisations played their part, and would have played a larger one should the Germans have ever attempted to invade. But that invasion never came because the principal precondition established by the Germans themselves – air superiority over the English Channel and southern Britain – was never met. The RAF, and primarily Fighter Command, made sure of this.

However, while pilots confronted and defeated the enemy in the air, their continuing efforts were only made possible by an extensive and complex ground organisation that had been carefully built up since the very earliest days of the RAF's existence.

This organisation fed, equipped and cared for the pilots on the ground and directed their efforts in the air while also keeping their aircraft in flying condition and providing the fuel, ammunition and spare parts they needed to get off the ground.

Flying Officer (later Air Commodore) Al Deere of No. 74 Squadron recalled, “On-the-spot repairs of damaged aircraft were carried out by our own ground crews, who were magnificent. All night long, lights burned in the shuttered hangars as the fitters, electricians, armourers and riggers worked unceasingly to put the maximum number on the line for the next day's operations. All day too they worked, not even ceasing when the airfield was threatened with attack. A grand body of men about whom too little has been written but without whose efforts victory would not have been possible.”

Growing from some 230,000 personnel in June 1940 to over 350,000 by the end of the Battle of Britain, these men and women are the ‘Forgotten Many’.

Foundations of an air force

Through the 1920s the RAF was struggling to survive in an age of stringent financial restrictions. Despite the many calls on the RAF and Air Ministry's purse, the chief of the Air Staff, Sir Hugh Trenchard, resolutely implemented his plans to invest in the future. He established technical schools and apprentice schemes to ensure the long-term flow of adequate numbers of well-trained and educated young men into his noncommissioned ranks – a novel idea, unheard of in either of the other services. In fact, the apprentice schemes were actually quite revolutionary across the whole of society. Apprentices (or at least their families) usually

An RAF apprentice works on an aircraft's engine. The highly skilled teams on the ground played a vital role in the Battle of Britain



Image source: Alamy





THE FORGOTTEN MANY

**“ON-THE-SPOT REPAIRS OF
DAMAGED AIRCRAFT WERE CARRIED
OUT BY OUR OWN GROUND CREWS,
WHO WERE MAGNIFICENT”**

— FLYING OFFICER AL DEERE,
NO. 74 SQUADRON

Pilots engage Messerschmitt 109s over southern England. They were kept in the fight by a vast support network, which brought them to the right place in the sky, kept the pilots fed and ready and repaired damaged planes and airfields



DEATH FROM ON HIGH

had to pay their employers, reimbursing them for taking the time and effort to train their students in the mysteries of their trade. However, the members of the Aircraft Apprentices Scheme at No. 1 School of Technical Training, based at RAF Halton, not only received first-class tutoring in a range of engineering and technical trades but they also received pay. Particularly for working class applicants, this made the apprentice scheme a unique opportunity to secure their future, and competition for the 1,000 or so places each year was intense. It made the scheme expensive, but through it Trenchard was laying solid foundations and ensuring the quality of his rank and file for decades to come.

Apprentices could join between the ages of 15 and 17-and-a-half and trained for three years. In the late 1930s, as the RAF expanded, the apprentice scheme was supplemented by a Boy Entrants scheme, where applicants who did not quite reach apprentice entry-level were entered into a slightly lower-level 12-18 month course.

Anyone over the age of 17-and-a-half could join as a man, attending two months of basic training at the RAF Depot at RAF Uxbridge before going for a range of specialist training. No. 3 School of Technical Training at RAF Manston, for example,

could turn a man into a blacksmith in a year, a fabric worker in six months, or either a motor transport driver or an aero-engine fitter in four months. At the Electrical and Wireless School at RAF Cranwell, meanwhile, courses ranged between six months and two years on a variety of specialist subjects.

Whether you were a former apprentice (known colloquially as 'Halton Brats') or joined through another route, graduation from these training courses was just the start. Personnel would have to undertake regular further training courses (some as 'placements' with manufacturers), and promotions depended on passing 'Trade Tests' to prove competence in your chosen area. Particularly for Brats, by the time they reached the ranks of noncommissioned officers, the technical levels of education achieved were not far short of the equivalent of university courses.

Officers faced a different course. Some specialisms existed – engineering officers, for example, went through extensive technical training at the Home Aircraft Depot at Henlow. But the vast majority of officers joined as 'general duties', and in the 1930s this required them to qualify as pilots (although of course not all pilots were officers; about a quarter were sergeants).

“THIS ATTRACTED ADVENTUROUS YOUNG MEN WHO WERE CAPTIVATED BY THE EXCITEMENT AND ADVENTURE OF FLYING BUT WHO DID NOT WANT TO COMMIT THEMSELVES TO A FULL CAREER”



Two members of the ground crew chat with Squadron Leader Peter Townsend DSO DFC on their Hawker Hurricane at RAF Wick

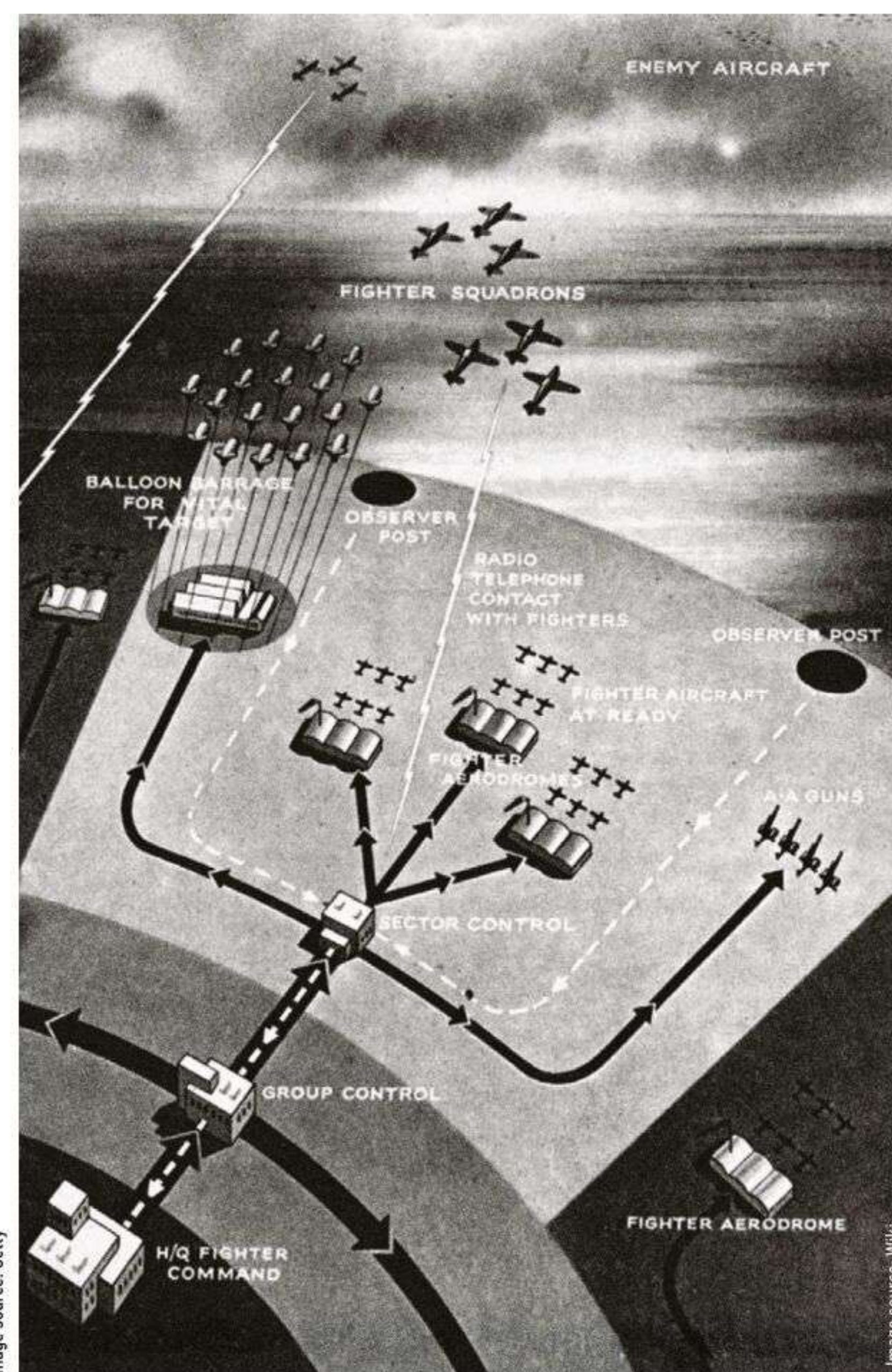
Ground crew aim for a quick turnaround as they refuel a Hawker Hurricane of No. 32 Squadron at RAF Biggin Hill in August 1940 while the pilot waits in the cockpit



Image source: Getty



Right: An illustration from a pamphlet produced by the Air Ministry in 1941 showing the air defence network, known as the 'Dowding system'. The significant role of radar was omitted as it was still considered a secret



RAF trainee technical staff going through a small part of their extensive – and never-ending – training

“IT WAS ALSO A FALLACY ALL ALONG TO THINK THAT THE RAF COULD BE THUS BOMBED INTO SUBMISSION”

However, officers were always in short supply, so in the mid-1930s the Short Service Commission system was introduced, where men could join for a four-year term, extended to six years in 1939. This attracted adventurous young men who were captivated by the excitement and adventure of flying but who did not want to commit themselves to a full career in the RAF. They would spend about a year in flying training before joining a frontline squadron, where their training would then continue.

By 1939 about four per cent of RAF officers were on these short-term enlistments. Due to the nature of their commissions and the career structure of the service, it meant that the vast majority of pilots on flying squadrons were Short Service Commission men. By 1940 the mobilisation of the Auxiliary Air Force and RAF Volunteer Reserve had further diluted the number of career officers in squadrons.

These factors meant that in the average squadron during the Battle of Britain, the ground crews were overwhelmingly career professionals, with longer service and more advanced training than the aircrew they supported.

Fighting the Battle of Britain

On 16 July 1940, Adolf Hitler issued Führer Directive No. 16, calling for the destruction of the RAF in preparation for an invasion of Britain. With little progress having been made over the next two weeks, on 1 August he issued Directive

No. 17, calling for the Luftwaffe to overwhelm the RAF in the shortest possible time, with an absolute deadline of 15 September. After further preparation, during which small-scale attacks were made on coastal targets, and following delays due to bad weather, 13 August was announced as Aldertag ('Eagle Day') – the first day of Unternehmen Adlerangriff ('Operation Eagle Attack'), the campaign to destroy the RAF.

This first mass assault by the Luftwaffe against the RAF was a failure. Although heavy raids were launched against airfields and radar sites, poor intelligence meant that large parts of the attack were wasted on Coastal and Bomber Command airfields rather than concentrating on the vital fighter airfields. It was also a fallacy all along to think that the RAF could be bombed into submission. Fighter Command's airfields were almost entirely grass fields, and an extraordinary number of bombs needed to be dropped evenly across them to leave no space at all for fighters to land. While airfield buildings could be destroyed, improvisation and an excellent logistics system meant that equipment and material could be quickly replaced, and only once was a Fighter Command station closed for more than a few hours due to enemy action during the battle.

Fighter Command's command and control system was extensive and dispersed over a wide area. Radar stations were hard to destroy due to the resilient structure of the radar masts – blast waves mostly went straight through them – and



WAAFS AT WAR

THE WOMEN'S AUXILIARY AIR FORCE (WAAF) FORMED IN 1939. DURING THE BATTLE OF BRITAIN IT PROVED TO BE A VITAL PART OF THE RAF

The Women's Royal Air Force (WRAF) had existed from 1918-1920 before falling foul of defence cuts. In 1939 a new WAAF was formed from RAF companies of the Auxiliary Territorial Service. Although they carried out traditional 'women's' domestic and clerical work, they also staffed operations rooms, radar sites and barrage balloon units.

The Battle of Britain showed the WAAF to be a highly valuable resource, and soon women were also engaged in technical and engineering trades (as the WRAF had been), working on aircraft and heavy equipment.

Although Corporal Daphne Pearson had already won the George Cross in May 1940 for rescuing crew members from a burning bomber, the Battle of Britain would give the WAAF a chance to prove their courage under fire en masse. During the Battle of Britain six WAAFs would be awarded Military Medals, three of them at RAF Biggin Hill.

On 18 August 1940, Sergeant Elizabeth Mortimer stayed at her post in the station armoury during an air raid, manning a telephone switchboard that was vital for co-ordinating the

defence of the station. Despite being ordered to take cover, she sat through the air raid and then joined teams planting red flags by unexploded bombs so that landing pilots could avoid them.

On 30 August the station was attacked again and two air raid shelters were hit by bombs. In one, 39 ground staff were killed, while in the other one WAAF was killed and many more were buried alive for several hours until rescued. On 31 August yet another raid hit Biggin Hill and two WAAFs, Sergeant Helen Turner (ex-WRAF) and Corporal Elspeth Henderson, both ignored orders to take shelter and remained at their posts in the operations room. As bombs fell around them they kept the crucial lines of communication open.



"DESPITE BEING ORDERED TO TAKE COVER, SHE SAT THROUGH THE AIR RAID AND THEN JOINED TEAMS PLANTING RED FLAGS NEXT TO UNEXPLODED BOMBS"

WAAFs Joan E. Mortimer, Elspeth C. Henderson and Helen E. Turner, who all received the Military Medal for their actions under fire at RAF Biggin Hill

Some of 'the Few', none of whom would have been able to take off without the efforts of 'the Many'



Image source: Getty

the small size of the huts where the operators and equipment sat. The vital filter rooms and different level operations rooms, which sifted and made sense of incoming information and directed aircraft accordingly, were also small, dispersed and sometimes underground.

Likewise the logistics network that repaired aircraft, replaced expendables (such as fuel, ammunition, oxygen and spare parts) and provided new aircraft was also massive and widely spread out. RAF Maintenance Command consisted of four groups, plus some ancillary units. No. 40 Group had some 23 depots amounting to 790,000 square metres (8.5 million square feet) to contain and issue equipment of all types, from trucks to button sticks. No. 41 Group had 11 storage depots holding and issuing spare aircraft, the flow of which greatly increased as British aircraft production tripled in the first half of 1940.

Supporting them was the Air Transport Auxiliary, a civilian organisation that flew aircraft from factory to depot and then from depot to front-line station. In June 1940 it had about 100 pilots who were in some way ineligible for RAF service; some were foreign, some were over-age, and one-fifth were women. By the end of the battle, its strength had grown to 250 pilots and 350 aircrew and support staff, who freed up RAF pilots to fight.

No. 42 Group was responsible for the storage, movement and issue of munitions, oxygen and fuel, all of which were crucial to keep aircraft flying and fighting. It had 95 fuel depots and five munitions dumps spread around the country, and the handling and transportation of all of these commodities was dangerous and skilled work.

No. 43 Group dealt with repair and salvage. Supported by the Civilian Repair Organisation,

“WRECK RECOVERY HAD TO BE CONTRACTED OUT TO ANY CIVILIAN ORGANISATION WITH SUITABLE VEHICLES, INCLUDING DELIVERY AND REMOVALS FIRMS LIKE PICKFORDS”

the 35 units of the group were spread around the country to provide the men and equipment for the repair of aircraft that were too damaged to be patched up by their own ground crews. They also oversaw the collection of wrecked aircraft. Crashed RAF aircraft were of course prioritised – not only would wrecked British aircraft littering the countryside be bad for public morale, but they could also be stripped for parts that could be refurbished and reused and the rest of the materials sent for recycling.

Downed German aircraft would be assessed for intelligence value. During the battle, the demand for salvage crews outstripped the RAF's resources, so much so that wreck recovery had to be contracted out to civilian organisation with suitable vehicles, including delivery and removals firms like Pickfords.

Into action

In the summer of 1940, the day started well before dawn for fighter station ground staff. They could be hauling themselves out of bed as early as between 3am-4am, dressing and going to the canteen for breakfast. Then they would prepare their station or squadron for action.

The personnel dedicated to caring for aircraft would set about preparing 'their' aircraft. Each fighter had a dedicated two-man ground crew – a rigger and a fitter. A flight sergeant with No. 249 Squadron recalled that, "Each aircraft had its own crew. As a result everybody is very proud of the fighter in his charge. And a healthy rivalry develops, too. They are like the boys in racing stables who groom their own particular horse, call it pet names, slap it affectionately and kiss it when it wins a race... Once a pilot came back from a battle after shooting down a Junkers 88 and two Messerschmitts. The crew that serviced that Hurricane did a war dance and went about swanking to the other crews. They regarded the three at one crack as THEIR work."

Crews would remove canopy and wing covers then start the engine to warm it up before conducting basic checks. Specialists who cared for particular parts of several aircraft – armourers, instrument fitters and wireless mechanics among others – would also do their rounds. Starter motors would be plugged in to make sure the aircraft could be instantly started and running by the time a scrambling pilot arrived. The same flight sergeant recalled, "If it takes more than two-and-a-half minutes from the warning to the time all the aircraft are in the air, well, there is usually an inquest, at which I am the coroner."

After a long, tense wait, their aircraft would hopefully return, when more minutes of frantic activity followed, even if it was not damaged. The anonymous flight sergeant also said, "As soon as the first one lands it taxis towards the waiting ground crew. A tanker goes alongside to fill up the petrol tanks. At the same time the armourers re-arm the eight Browning guns. The rigger changes



"THE FLIGHT SERGEANT RECALLED, 'IF IT TAKES MORE THAN TWO AND A HALF MINUTES FROM THE WARNING TO THE TIME ALL THE AIRCRAFT ARE IN THE AIR, WELL, THERE IS USUALLY AN INQUEST, AT WHICH I AM THE CORONER'"

THE FORGOTTEN MANY

Armourers reload a Hawker Hurricane with belts of ammunition. Spitfires could be re-armed with pre-loaded magazines, which was faster, but some had to be fed in from below





CASUALTIES

13 AUGUST 1940 'ADLERTAG'

Fighter Command aircrew
Bomber Command aircrew
Coastal Command aircrew
Training Command aircrew
All Commands ground crew

COMBAT CASUALTIES	15	NON-COMBAT CASUALTIES	2
	52		9
	0		0
	0		3
	96		3

16 AUGUST 1940

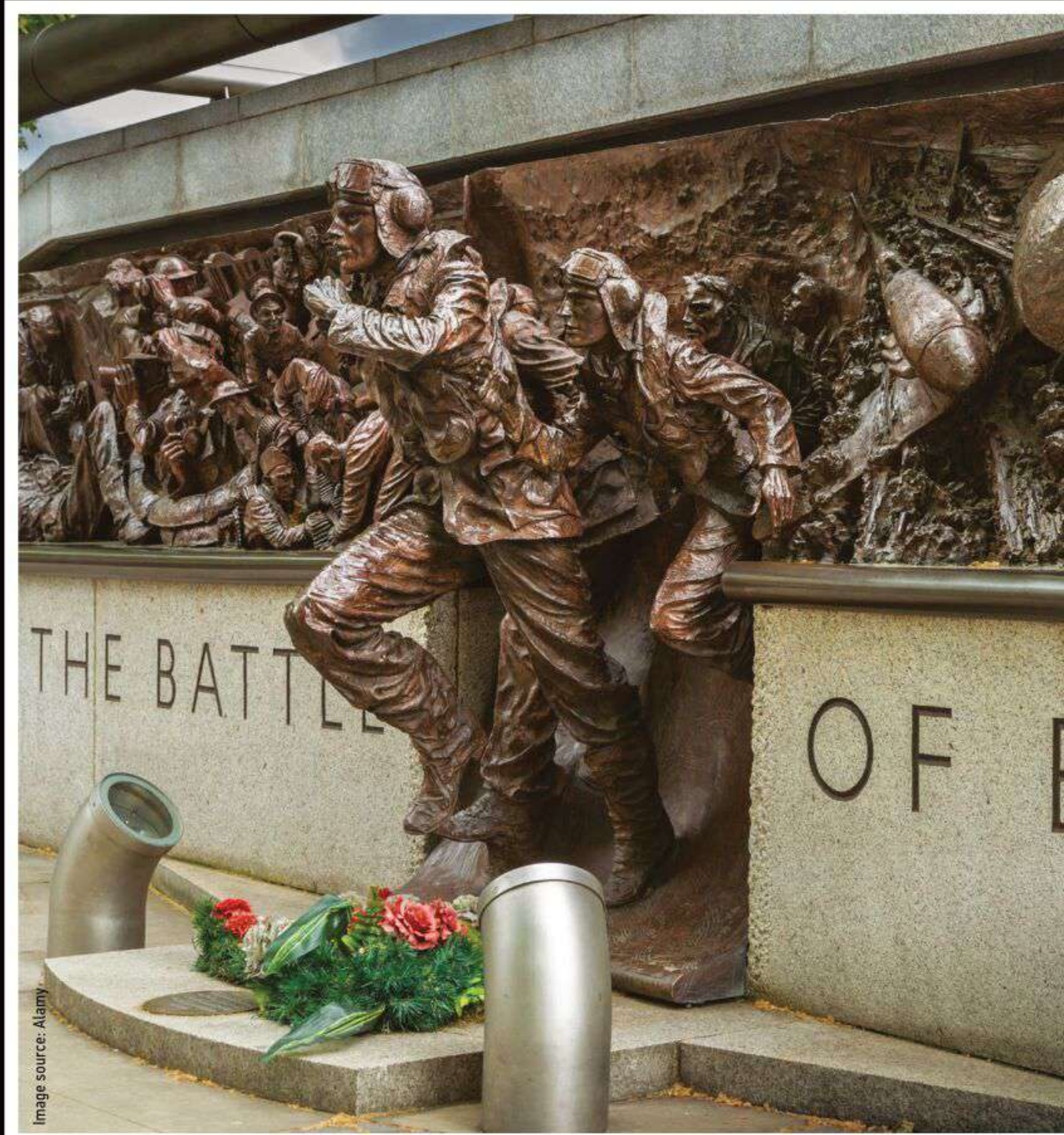
Fighter Command aircrew
Bomber Command aircrew
Coastal Command aircrew
Training Command aircrew
All Commands ground crew

COMBAT CASUALTIES	22	NON-COMBAT CASUALTIES	2
	16		0
	1		0
	0		2
	43		3

18 AUGUST 1940 'THE HARDEST DAY'

Fighter Command aircrew
Bomber Command aircrew
Coastal Command aircrew
Training Command aircrew
All Commands ground crew

COMBAT CASUALTIES	28	NON-COMBAT CASUALTIES	2
	2		7
	0		0
	1		1
	37		1



the oxygen bottles and fits the starting-motor to the aircraft so that it is ready for the next take-off. Then the rigger takes some strips of fabric which he has brought with him from the crew-room and places them over the gun holes. It helps keep the guns clean and also helps to keep the aircraft 100 per cent efficient in the air until the guns are fired.

"Meanwhile, another member of the crew searches the aircraft for bullet holes, and the electrician goes over the wiring and the wireless mechanic tests the radio set. Every little part of the aircraft is OK before the machine is pronounced serviceable again. All this process should take no more than five minutes, but we allow seven minutes for the whole job... Once we serviced a squadron which came back more or less together in eight and a half minutes.

"If a Hurricane comes down with a few bullet holes, it is my job to see if the injuries are superficial or not. If there are holes through the fabric, we quickly patch them up. If there is a bullet thought the main spar, then it is a new wing."

In between these periods of intense activity, while the pilots waited for the call to scramble or tried to unwind after landing, the ground crews would still be busy. Work would be carried out to make grounded aircraft airworthy again, routine maintenance would be done on the aircraft that were not flying (even on the busiest of days it was unlikely the whole squadron would fly at once), bomb craters could be filled in, and preparations made for the next scramble. In quiet moments a cup of tea and a sandwich ('char and a wad') might be grabbed from the canteen or a NAAFI van.

While the ground crews worked on the aircraft, the other ground staff at the station would carry on their routine tasks to keep the airfield running.

**"THE LOUDSPEAKER...
APPEALED, 'TAKE COVER!
TAKE COVER!' WITHIN THREE
MINUTES OF THAT WARNING
I SAW THE FIRST OF THE
JUNKERS COMING STRAIGHT
DOWN ON THE 'DROME IN A
VERTICAL DIVE"**

Cooks, cleaners and maintenance staff would go about their daily routines. Clerks would sort, complete and send off the paperwork that would keep crucial supplies and replacement parts flowing in. Days over that summer would be long, exhausting marathons until the Sun slipped beneath the horizon. The flight sergeant recalled, "Finally, at nightfall, we make the daily inspection. The armourers clean the guns, the fitter checks the engine over, the rigger checks round the fuselage and cleans it, and the wireless man checks the radio set. The instruments man checks the instruments. When everything is OK and the necessary papers signed, then the machine can be put to bed. The sleeves are put on the wings, the cover is put over the cockpit, the pickets are pegged into the ground and the machine left, heading into the wind, until dawn... During the summertime our hours are from about 3.30am until 10.30pm."

Between 13 August and 6 September 1940, the ground installations of the RAF were the

Luftwaffe's main target. During this period, and to a lesser extent even afterwards, the ground crews at sites in southern England often had to work under air attack, and sporadic attacks were made on stations further north too.

On many of these days the ground crews suffered higher casualties than the aircrews, and some stations were badly damaged. On 16 August, RAF Tangmere was targeted. LAC Maurice Haffenden, an engine fitter with No. 43 Squadron, recalled, "At 1pm the loudspeaker, with a greater urgency than before, suddenly appealed, 'Take cover! Take cover!' Within three minutes of that warning I saw the first of the Junkers coming straight down on the 'drome in a vertical dive. The leader was within 2,000 feet (610 metres) of the ground – long wingspan – fixed undercarriage – single engine – and then w-h-e-e-z... I went head-first down a manhole as the first bomb landed on the cookhouse. For seven minutes their 1,000-pounders were scoring direct hits and everything was swept away by machine gun bullets. I never believed such desolation and destruction to be possible. Everything is wrecked – the hangars, the stores, the hospital, the armoury, the cookhouses, the canteen – well, everything."

Squadron Leader Sandy Johnstone of No. 602 Squadron, based at nearby RAF Westhampnett, visited Tangmere that evening and "found the place in utter shambles, with wisps of smoke still rising from the shattered buildings. Little knots of people were wandering about with dazed looks on their faces, obviously deeply affected by the events of the day. I eventually tracked down the station commander standing on the lawn in front of the officer's mess with a parrot sitting on his shoulder. Jack was covered with grime and the wretched



The magnificent Battle of Britain Memorial on the Embankment in London, which acknowledges the large support network behind the pilots

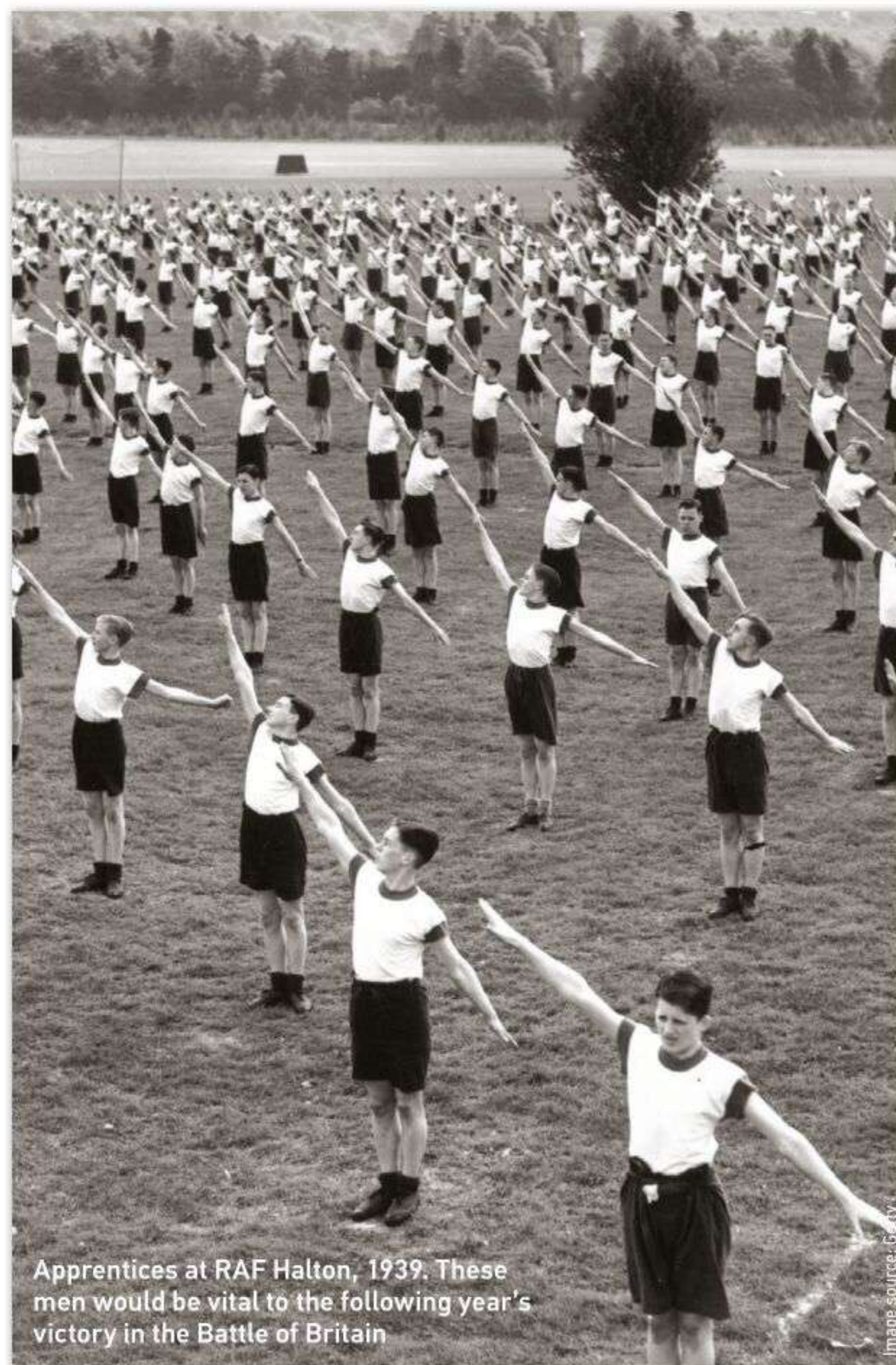
bird was screeching its imitation of a Stuka at the height of the attack! The once-immaculate grass was littered with personal belongings which had been blasted from the wing which had received a direct hit. Shirts, towels, socks and a portable gramophone – a little private world for all to see... Rubble was everywhere and all three hangars had been wrecked."

A total of 19 ground staff were killed at Tangmere, but despite the damage the station remained operational. Only RAF Manston would be closed for any extended period of time, after repeated heavy raids. The story of what has become known as the 'Manston Mutiny' was recounted by Len Deighton in his 1977 book *Fighter*, where it is said members of the ground staff refused to leave shelters and had to be forced out at gunpoint. There is no evidence for this at all. Deighton has always refused to reveal his source, and no other evidence has ever come to light.

'Spirit of Dunkirk'

In fact, morale held up incredibly well in most areas. It is tempting to look back on 1940's 'Spirit of Dunkirk', or later the 'Blitz Spirit', with scepticism, wondering how much is myth based on propaganda. But there is plenty of evidence of the nation pulling together.

An anonymous WAAF at Rye Radar Station witnessed this stoicism when her site was bombed on 13 August: "The deep, snarling roar of the bombers and the protecting fighters grew closer and closer till the whole hut vibrated with it. The Watch continued steadily giving height and speed and direction of attacking hostile aircraft to Fighter Command without a tremor in their voices. Suddenly the RAF Officer-in-Charge called,



Apprentices at RAF Halton, 1939. These men would be vital to the following year's victory in the Battle of Britain

"THE DEEP, SNARLING ROAR OF THE BOMBERS AND THE PROTECTING FIGHTERS GREW CLOSER AND CLOSER TILL THE WHOLE HUT VIBRATED"

"They're diving! Get down!" and only then did those airwomen move, and they moved as if you'd pressed a button! We all fell flat on the floor as the first stick of bombs burst... Everything loose shot off the tables, shutters were blown in, and glass flew in every direction. The floor and hut shuddered, and chairs and tables overturned on to us. Through clouds of dust I saw legs and arms protruding from underneath the debris; to those in reach I gave a friendly pat and an assurance that they were all right and must remain still... At last, after what seemed like hours, we dared to raise our heads... What a scene of wreckage and devastation it was!

"The Station buildings were all wrecked... and there were enormous craters all over the place. But... we were back on the air in 20 minutes."

Sergeant Iain Hutchinson was a pilot with No. 54 Squadron at RAF Hornchurch and witnessed another example of the strong team spirit. "The airfield was under attack and chunks of shrapnel were raining down on the airfield. When I taxied towards the dispersal no one was to be seen; they were all in the air-raid shelters taking cover. Before I rolled to a halt and cut the engine, 'B' Flight ground crew, under their flight sergeant, were swarming around my Spitfire; the bowser was racing out to refuel the aircraft, while the armament men, laden with ammunition, were reloading the guns. The

GROUND STAFF

NOT ALL STATION PERSONNEL WORKED DIRECTLY ON KEEPING THE AIRCRAFT FLYING, BUT THEY ALL PLAYED THEIR PART IN KEEPING THE FIGHTER PILOTS FIGHTING

PARACHUTE PACKERS

Male and female packers maintained and carefully packed the parachutes that could save a crew member's life. One slight slip in packing or a missed minor fault could have disastrous results in an emergency.

BATMEN

Batmen looked after the officers in their quarters, waking them and bringing their morning tea, taking care of their laundry and other domestic chores – small matters, but they eased the otherwise stress-filled life of a pilot.

COOKS

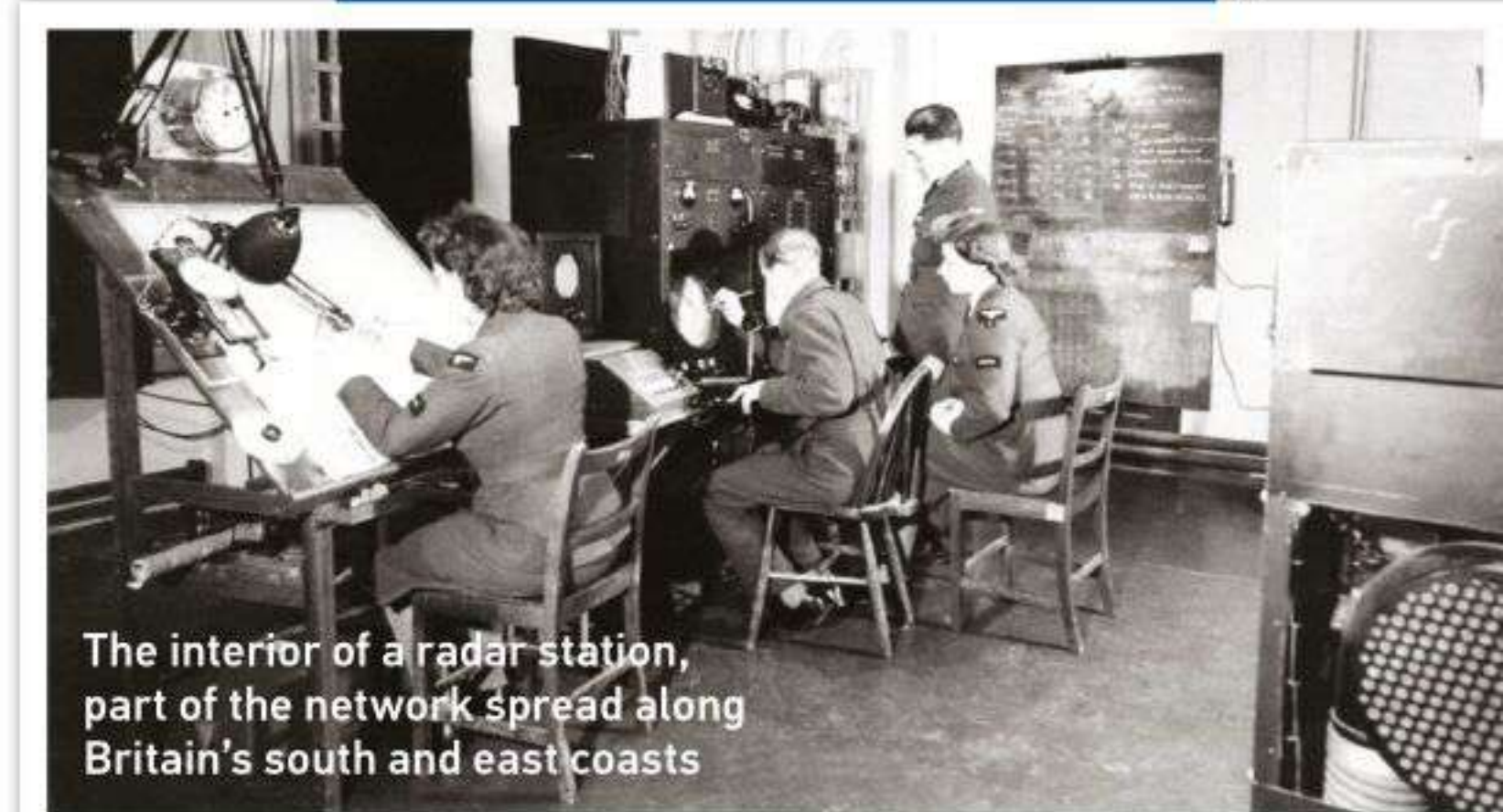
Never underestimate the physical and mental boost that comes from a hot meal or cup of tea. For air and ground crews working intense, 18-hour days, a constant stream of sustenance was vital.

FIREMEN

A fireman's job was a dangerous one, whether putting out fires in bombed buildings or trying to rescue crews from crashed and burning aircraft. In either case, unexploded bombs or ammunition could 'cook off' at any second.

WIRELESS & TELEPHONE OPERATORS

Fast and efficient communications were the cornerstone of the RAF's success. Whether directing pilots in the air or calling a depot for crucial parts and materials, they were critical to keeping the system functional.



The interior of a radar station, part of the network spread along Britain's south and east coasts

Image source: Alamy

"THE NOISE FROM THE EXPLOSIONS GOING ON AROUND US WAS TERRIFYING, BUT NOT ONE OF THOSE MAGNIFICENT MEN FALTERED FOR A MOMENT IN THEIR TASKS"



Armourers re-arming a Supermarine Spitfire at RAF Hawkinge, July 1940. Some of the Spitfire's guns had to be loaded from below, an awkward operation

noise from the explosions going on around us was terrifying, but not one of those magnificent men faltered for a moment in their tasks. I was frankly relieved to be taking off again."

Of course, there were limits though. Jack Shenfield, a mechanic with the same squadron at RAF Hornchurch, also witnessed a more pragmatic approach in action. "I got into the shelter, we were all packed in there, and the sergeant had closed the door. We had been only in there a minute or so when there was a banging at the door. He opened the door and it was the driver of the bowser; this was the vehicle that carried all the high-octane petrol for the aircraft. He'd parked the thing outside the shelter with all the bombs falling all around. The sergeant said, 'Sod off, and take that bloody thing with you, and park it somewhere else before you blow us all to pieces.' The driver had to go back and park it before they'd let him into the shelter."

Such human lapses aside, the efforts of the RAF's ground crew and ground staff during the Battle of Britain formed an incredibly strong foundation on which the aircrews could operate.

Especially during the period between 13 August and 7 September, the RAF's infrastructure and ground personnel were the main target of the Germans' relentless attacks, although of course raids were made on airfields and radar sites before that and would continue to be made (albeit on a smaller scale) afterwards.

In fact, in some ways the raids became more dangerous, as large, easily spotted and tracked

formations of bombers gave way to individual aircraft or small formations that arrived at low level and high speed. Little or no warning could be made for these raiders, and personnel were regularly caught out in the open without a chance to reach shelter. For example, ATA pilot Lettice Curtis would recall being caught in the open as she walked across Hatfield Airfield, near the de Havilland factory, on 3 October 1940.

"As so often happened, the air raid warning and the bombs came at the same instant and one bomb fell very near indeed to those running from the office to the shelters. Luckily for them it did not explode on impact, otherwise we would almost certainly have lost, amongst others, Pauline Gower, our Commanding Officer, who was nearest to the bomb at the time.

One of the bombs, however, did land on a factory workshop and 21 people were killed and some 70 were injured. The bombs had been dropped from around 100 feet (30 metres) and the pilot had

machine-gunned the workers running to the shelters."

That aircraft, a Ju-88a of 1/KG77, dropped four bombs, one of which failed to explode, but the element of surprise allowed it to achieve a disproportionate effect (even if it was almost immediately shot down and the crew captured).

Although the direct attacks on stations decreased, the Battle of Britain would still rage for two more long, exhausting months before the Germans switched to night attacks. Though the danger decreased somewhat, the long hours and gruelling pace of work did not.

The outnumbered fighter pilots who would climb repeatedly into their aircraft to take to the skies and defend the nation could do so with the knowledge that they were the sharp point of a vast, well-trained and efficient machine intended to put them in the right place at the right time and with their aircraft in the best possible condition to take the fight to the enemy.



GPO

THE GENERAL POST OFFICE WAS ANOTHER PART IN THE INTRICATE SYSTEM

The General Post Office (GPO) owned the telephone lines, exchanges and other equipment that were crucial to binding together the RAF's command and control system, as well as its day-to-day activities. Its staff carried out vital maintenance and repair work, often while the stations and radar sites they were supporting were under attack. Without their efforts, RAF Fighter Command would have lost its key edge: the ability to gather and disseminate information and then direct its aircraft to enemy formations.

Images: Alamy, Getty

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DEATH FROM ON HIGH

HAWKER HURRICANE

WORDS MIKE HASKEW

This aircraft bore the brunt of the Luftwaffe onslaught during the early days of World War II



Above: The Hawker Hurricane, one of the RAF's most successful fighters



Although its legacy exists in the shadow of its RAF cohort, the Supermarine Spitfire, the Hawker Hurricane was the workhorse of Fighter Command early in World War II. At the beginning of the Battle of Britain, in late summer 1940, half the squadrons of Fighter Command were equipped with Hurricanes, while only 20 were flying the Spitfire. The remainder were assigned the inferior and vulnerable Boulton Paul Defiant.

The Hurricane also wrote heroic chapters in the aerial defence of the island of Malta in

the Mediterranean, in North Africa, and on the European continent, as the Nazi war machine invaded France and the Low Countries and the British Expeditionary Force required tactical air support. Throughout the war the Hurricane was also the mainstay of Commonwealth air forces in the Far East.

The first operational monoplane RAF fighter, the Hurricane was also the first such aircraft to exceed an airspeed of 480 kilometres per hour (300 miles per hour), tracing its origin to 1933, when work

began on the Hawker Fury monoplane powered by a Rolls-Royce Goshawk engine. The following year, the Air Ministry issued specifications for a new fighter. A design conference was held a few months later, and the prototype flew on 6 November 1935.

The Hurricane entered service with No. 111 Squadron at Northolt in December 1937, and the aircraft was modified on several occasions, with the addition of self-sealing fuel tanks, additional underwing drop tanks, alterations for service

"THE FIRST OPERATIONAL MONOPLANE RAF FIGHTER, THE HURRICANE WAS ALSO THE FIRST SUCH AIRCRAFT TO EXCEED AN AIRSPEED OF 480 KILOMETRES PER HOUR"



HAWKER HURRICANE

COMMISSIONED	1937
ORIGIN	UK
LENGTH	9.75M (32FT)
RANGE	740KM (460MI)
ENGINE	1,030-HORSEPOWER, LIQUID-COOLED V-12 ROLLS-ROYCE MERLIN II OR III
PRIMARY WEAPON	8 X BROWNING .303-CALIBRE MACHINE GUNS
SECONDARY WEAPON	2 X 113KG (250LB) OR 227KG (500LB) BOMBS
CREW	1

FUSELAGE OF DURALUMIN AND WOOD

in desert and tropical climates, and racks that could carry up to two 227-kilogram (500-pound) bombs for performing the fighter-bomber role.

In September 1944, the last Hurricane built in Britain was delivered to the RAF. More than 14,000 were completed, 12,950 by Hawker and Gloster Aircraft Company in Britain. More than 1,000 were built in Canada by the Canadian Car & Foundry Co.



DEATH FROM ON HIGH



The Hawker Hurricane reveals its distinctive hump just aft of the cockpit

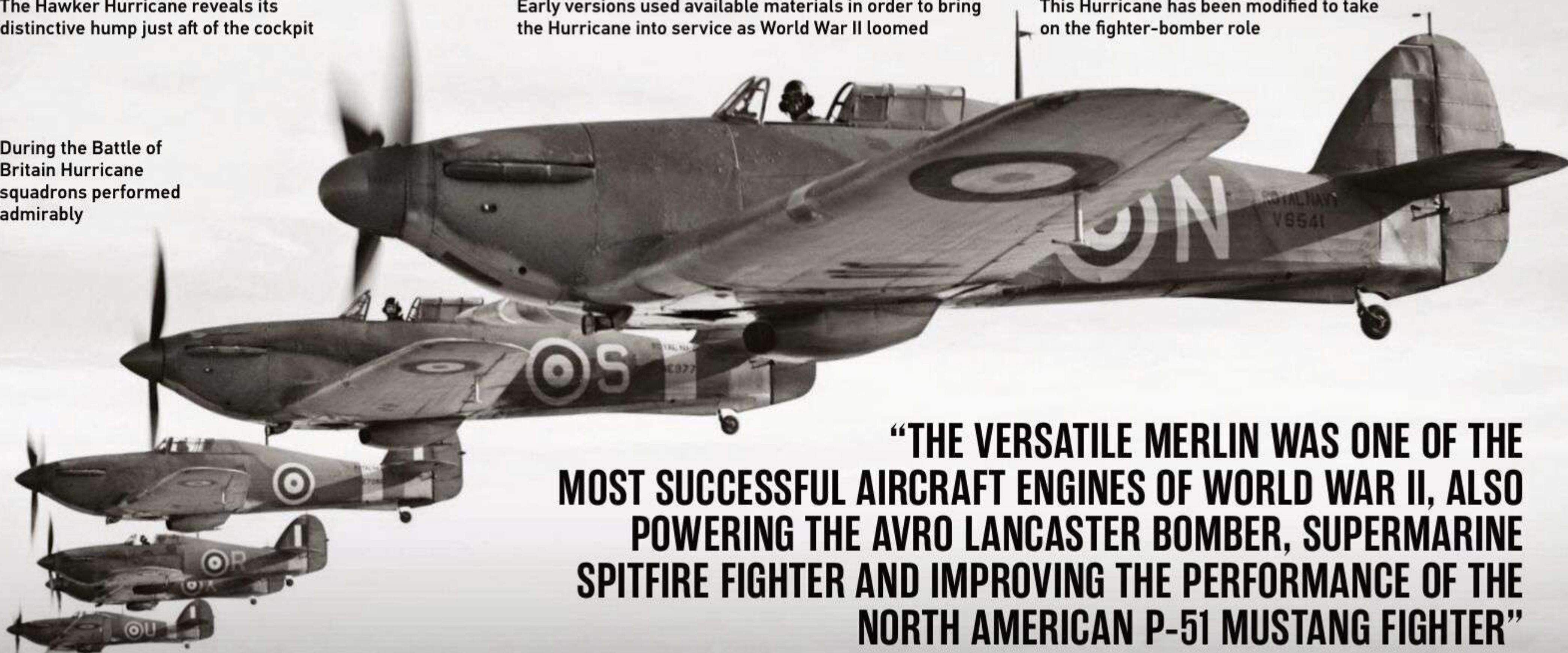


Early versions used available materials in order to bring the Hurricane into service as World War II loomed



This Hurricane has been modified to take on the fighter-bomber role

During the Battle of Britain Hurricane squadrons performed admirably



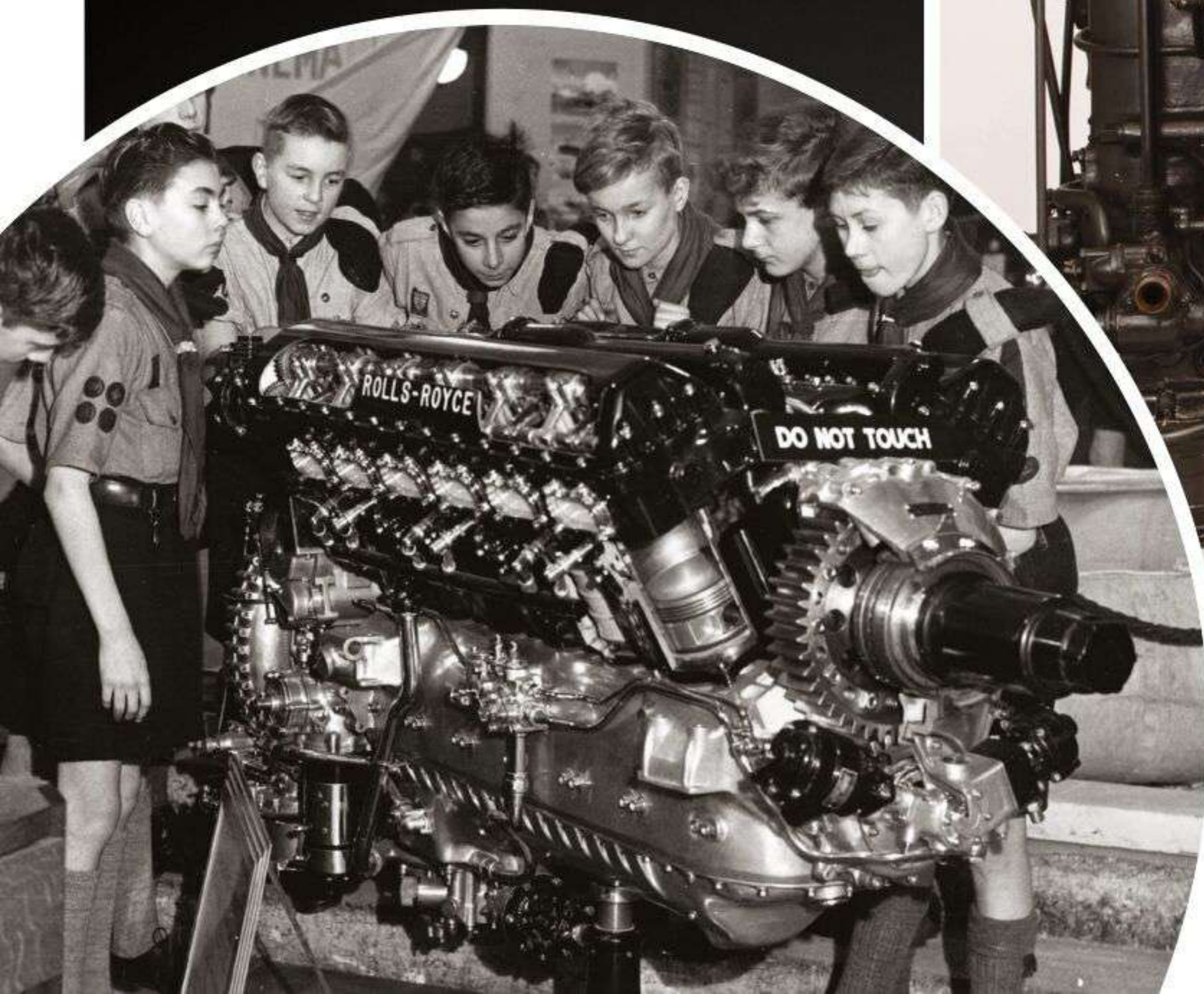
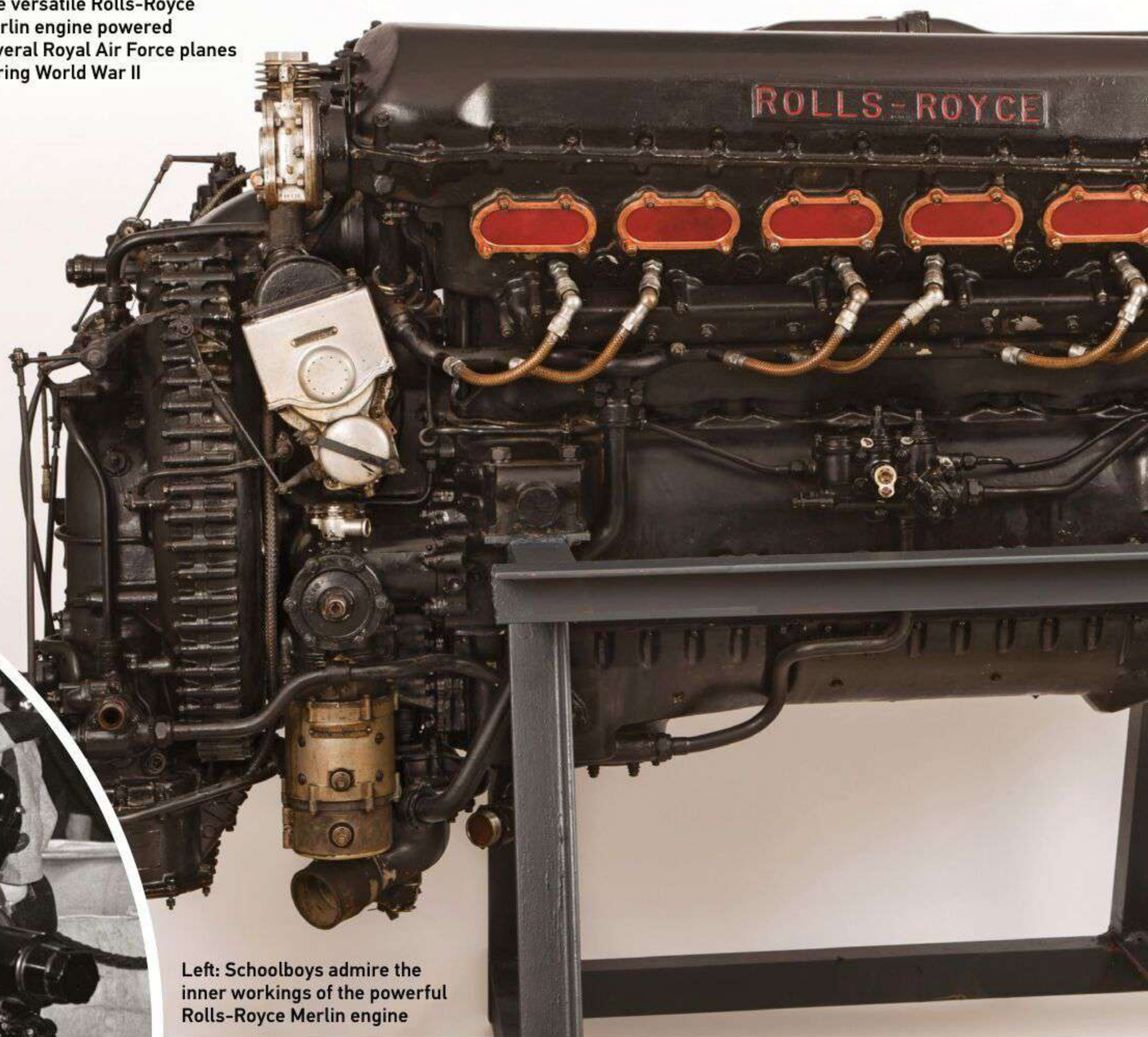
“THE VERSATILE MERLIN WAS ONE OF THE MOST SUCCESSFUL AIRCRAFT ENGINES OF WORLD WAR II, ALSO POWERING THE AVRO LANCASTER BOMBER, SUPERMARINE SPITFIRE FIGHTER AND IMPROVING THE PERFORMANCE OF THE NORTH AMERICAN P-51 MUSTANG FIGHTER”

ENGINE

The Rolls-Royce Merlin was a liquid-cooled, 12-cylinder inline aircraft engine developed in the early 1930s, with its first run on 15 October 1933. The versatile Merlin was one of the most successful aircraft engines of World War II, also powering the Avro Lancaster bomber, iconic Supermarine Spitfire fighter and improving the performance of the North American P-51 Mustang fighter plane.

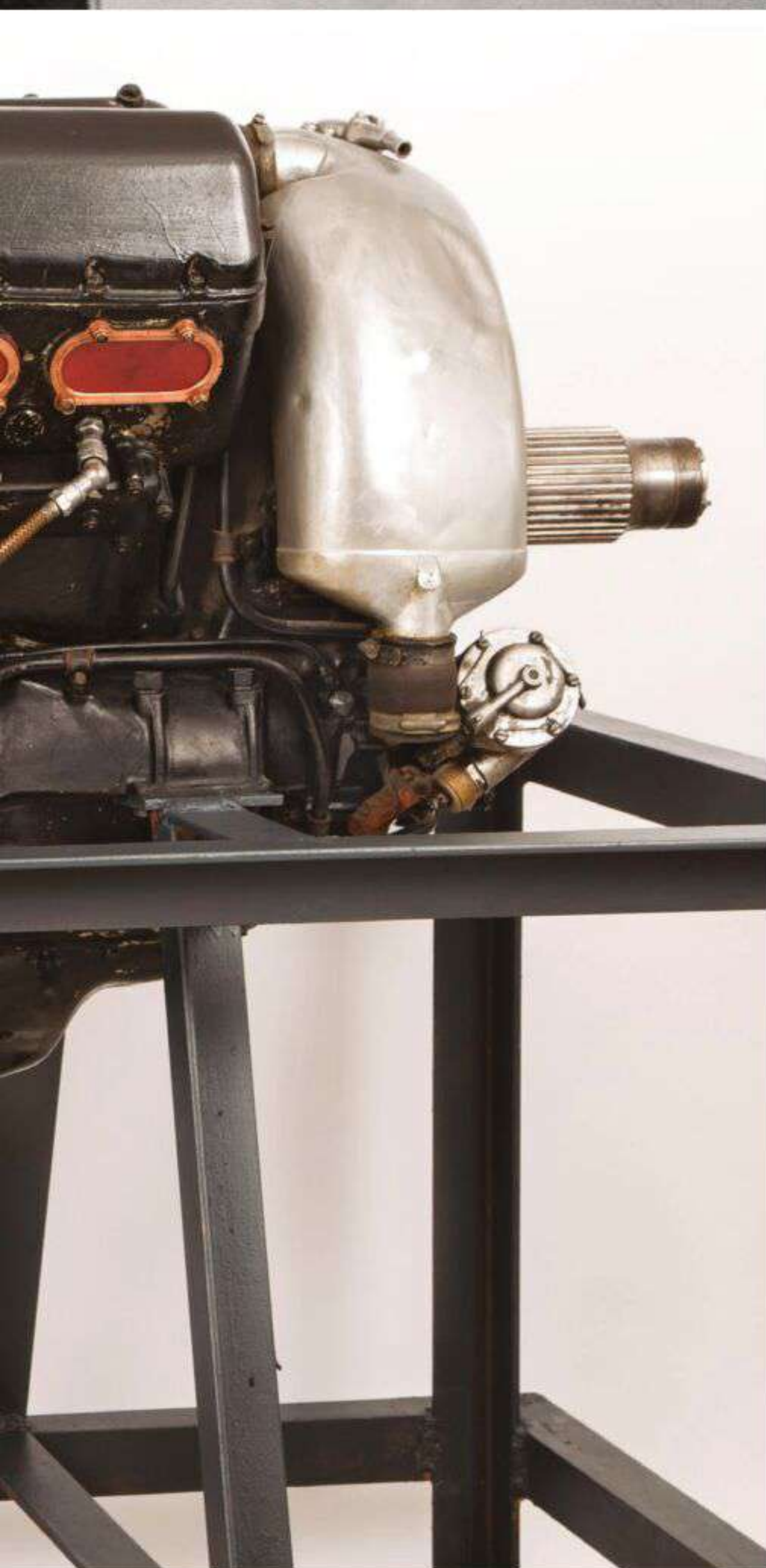
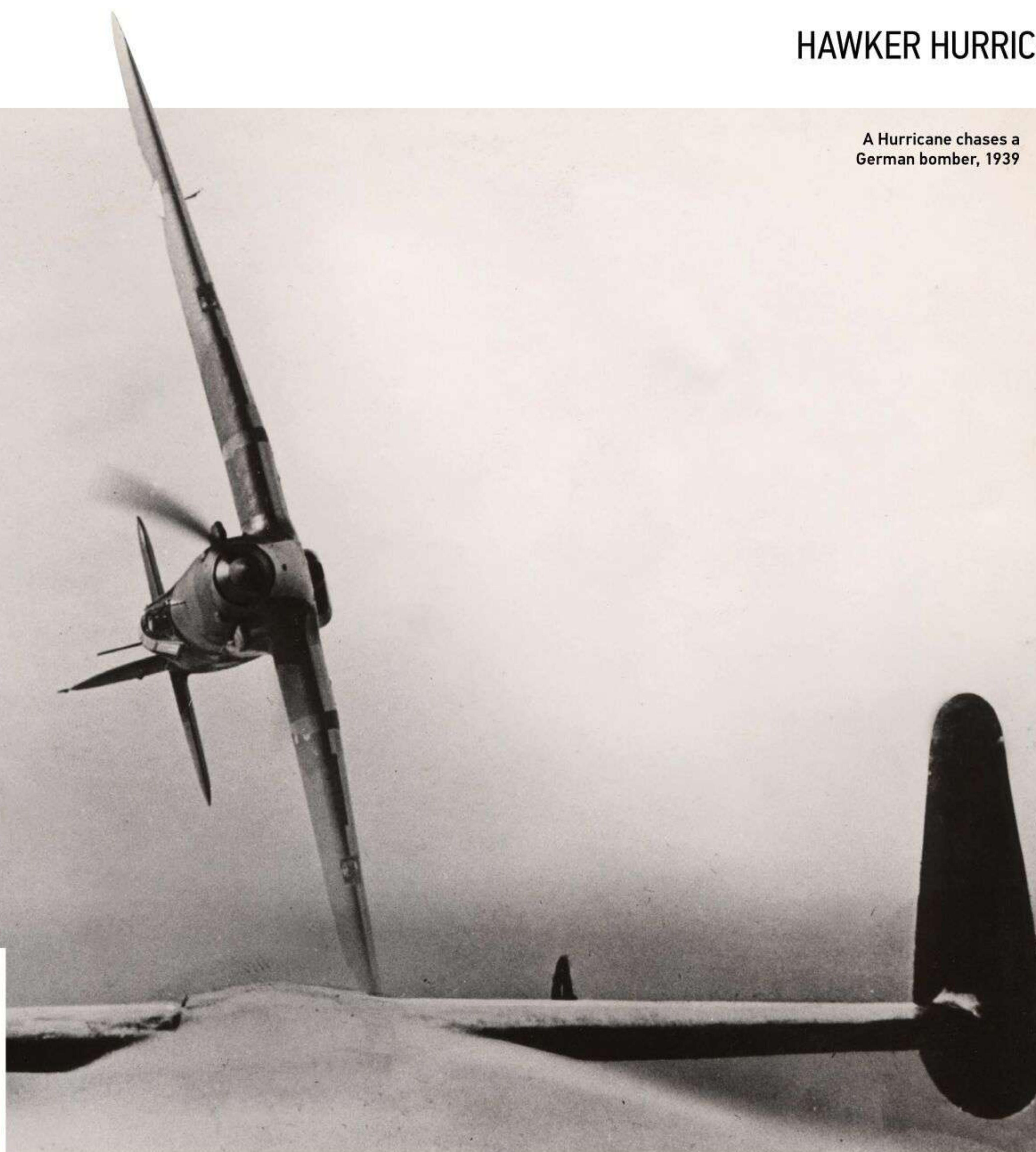
The Merlin delivered 1,030 horsepower, giving the Hurricane a top speed of 512 kilometres per hour (318 miles per hour). Performance improved throughout the war, and nearly 1,500 were built at Rolls-Royce factories in Glasgow, Derby and Crewe and in Ford of Britain's Trafford Park facility near Manchester.

The versatile Rolls-Royce Merlin engine powered several Royal Air Force planes during World War II



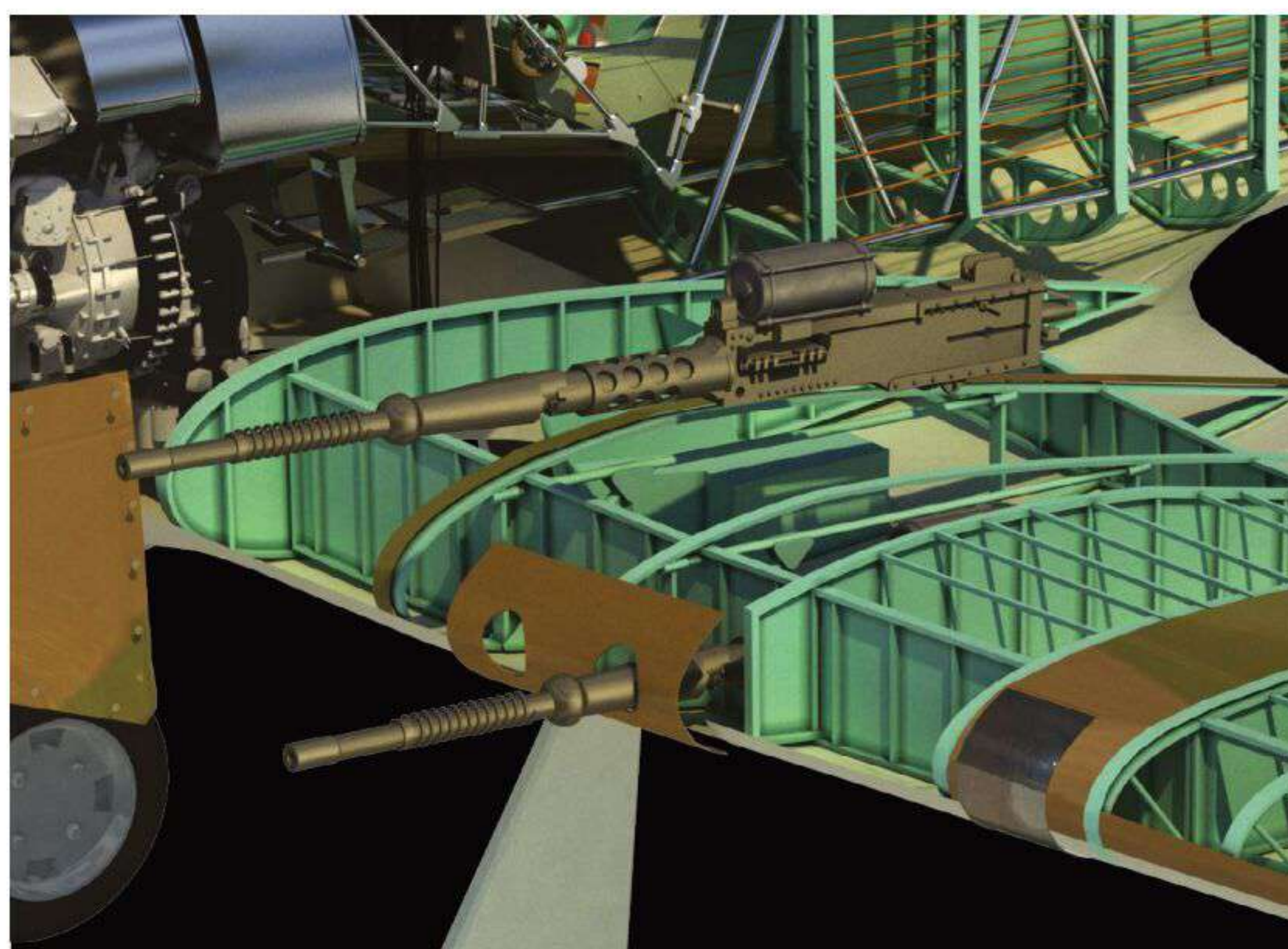
Left: Schoolboys admire the inner workings of the powerful Rolls-Royce Merlin engine

A Hurricane chases a German bomber, 1939



ARMAMENT

The early production Mk. I Hurricane was armed with eight wing-mounted Browning .303-calibre machine guns, while later versions mounted a variety of weapons. The IIB, for example, was upgunned with 12 .303-calibre machine guns and racks for a pair of 113-kilogram (250-pound) or 227 kilogram (500-pound) bombs. The IIC carried four powerful Hispano 20mm cannon and retained bomb capability, while the IID mounted a pair of Vickers 40mm S guns and two .303-calibre machine guns. The Hurricane IV carried two 40mm S guns, two .303-calibre machine guns and a pair of 227-kilogram bombs. Later variants proved to be effective tank-busting aircraft.



Above: .303-calibre Browning machine guns featured in several variants of the Hurricane

“THE EARLY PRODUCTION MK I HURRICANE WAS ARMED WITH EIGHT WING-MOUNTED BROWNING .303-CALIBRE MACHINE GUNS”

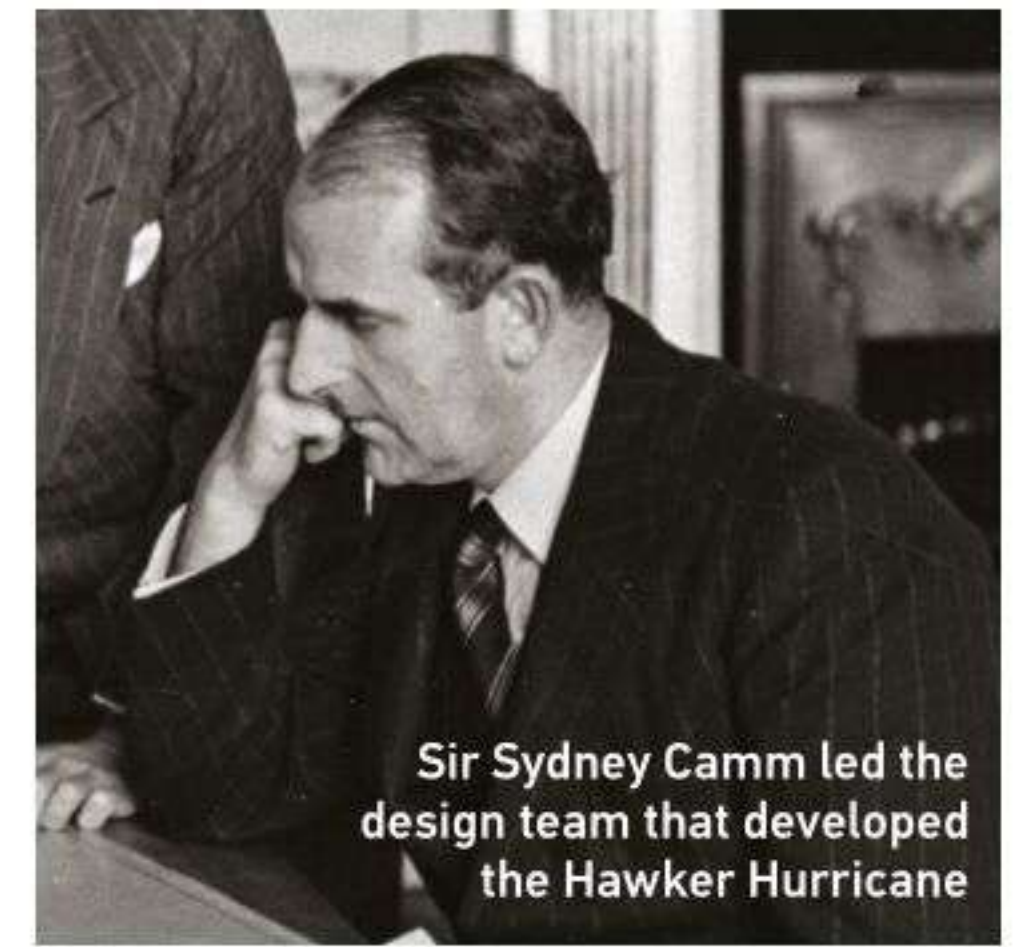


Female workers assemble the components of a Hawker Hurricane on the factory floor

Female workers assemble the components of a Hawker Hurricane on the factory floor

DESIGN

Aircraft designer Sir Sydney Camm developed the low-wing cantilever Hawker Hurricane. Early production aircraft wings were covered in fabric and were later replaced with stressed-skin metal wings, while the fuselage was of tubular duralumin and wood construction covered with fabric. This design aspect, at first an expedient to get the fighter into service, remained unchanged throughout production. The Hurricane was relatively heavy – a sturdy and stable gun platform. However, it was slower than the Spitfire and the German Messerschmitt Me 109. Its service ceiling of 34,000 feet (about 10,360 metres) was lower than the Me 109, and the pilot had to contend with a blind spot that made the Hurricane vulnerable to attack from the rear.



Sir Sydney Camm led the design team that developed the Hawker Hurricane

“THIS DESIGN ASPECT, AT FIRST AN EXPEDIENT TO GET THE FIGHTER INTO SERVICE, REMAINED UNCHANGED”

COCKPIT

The tight but efficient Hawker Hurricane cockpit included a standard instrument panel directly in front of the pilot's seat with the stick centred. The battery voltage strength indicator was to the left, with elevator and rudder trim control at lower left and throttle at upper left, along with fuel tank selectors for main and reserve supplies. The airspeed indicator, artificial horizon, vertical speed indicator, altimeter, direction gyroscope and turn-and-slip indicator were located left to right in a double row in the forward panel. Engine instruments, including boost gauge, oil pressure and temperature indicators, as well as the fuel pressure indicator, were to the right on the panel.

The cockpit placed a standard instrument panel directly in front of the pilot and in close proximity to the stick





During the Battle of Britain the Hurricane bore the brunt of RAF aerial defences against Luftwaffe bombers while the swifter Supermarine Spitfire took on fighters

SERVICE HISTORY

QUIET VICTOR IN THE BATTLE OF BRITAIN, THE HAWKER HURRICANE SERVED IN EVERY RAF THEATRE OF WWII

While the Supermarine Spitfire cut a dashing figure over Britain, the Hawker Hurricane might best be described as the not-so-comely stepsister. Nevertheless, the Hurricane held the line during the dark days of the Battle of Britain, shooting down more German aircraft than any other plane in Royal Air Force service. Hurricanes of No. 615 Squadron alone claimed nearly 100 enemy planes.

Although less manoeuvrable than the German Me 109 fighter and considerably slower, the

Hurricane could take severe punishment. Superior range also allowed it to remain airborne longer than its adversary. Compensating for the Hurricane's shortcomings as a dogfighter, RAF pilots developed effective tactics: the Hurricanes attacked German bombers, while the more nimble Spitfires tangled with enemy fighters.

On 17 August 1940, Flight Lieutenant J.B. Nicolson of No. 249 Squadron earned the Victoria Cross, shooting down an Me 110 fighter despite grievous wounds and flames streaking from his

damaged Hurricane. Wing Commander Robert Stanford Tuck of No. 257 Squadron and Sergeant Josef Frantisek of No. 303 Squadron were leading Hurricane aces during the Battle of Britain. The highest-scoring Hurricane ace of World War II was Squadron Leader Marmaduke 'Pat' Pattle with 35 victories in the Mediterranean.

Despite its shortcomings, pilots often praised the Hurricane. "It became a good friend right from the start," one airman related, "and I loved it more and more."

In 1941 RAF Squadrons No. 81 and No. 134 flew with the Soviet Red Air Force on the Eastern Front. In the China-Burma-India theatre, Hurricanes of No. 20 Squadron destroyed 13 Japanese tanks in a memorable mission. Hurricanes were outfitted as night fighters and were also catapulted from merchant ships, providing air cover for transatlantic convoys.

The Hurricane's service life stretched into the 1950s with the air forces of at least 25 countries. From 1945 to 1959 a single Hurricane was afforded the honour of leading the annual RAF fly-past over London to commemorate the Battle of Britain.

A Hurricane swoops down in a steady dive as its pilot acquires a ground target



"DESPITE ITS SHORTCOMINGS, PILOTS PRAISED THE HURRICANE. 'IT BECAME A GOOD FRIEND RIGHT FROM THE START,' ONE RELATED, 'AND I LOVED IT MORE AND MORE'"



DEATH FROM ON HIGH

THE WOMEN'S AUXILIARY AIR FORCE

WORDS FRANCES WHITE

The women who risked their lives, protected the nation and blasted social norms

The Women's Royal Air Force (WRAF) first came into being along with the Royal Air Force (RAF) in April 1918. However, by 1920 it was disbanded along with the other women's services. It was not until June 1939, when World War II seemed inevitable, that the Women's Auxiliary Air Force (WAAF) was formally established by King George VI. The Auxiliary Territorial Service (ATS) had previously existed as the female equivalent of the Territorial Army, but the motive behind the creation of the WAAF was that a separate women's air service was needed. It was not a totally independent service but rather interlinked to the RAF so women could be brought in to replace RAF personnel when required. Recruitment for the WAAF was not just from Britain; many overseas women also joined the organisation, and local recruitment took place in the Middle East from 1942, including recruits from the Egyptian, Palestinian, Greek and Cypriot communities.

The roles of women recruited into the WAAF initially consisted of clerks, kitchen orderlies and

drivers. This allowed men previously fulfilling these roles to instead be moved to front-line duties. These roles were generally seen as more acceptable for women due to their domestic nature. The ability of women to fulfil more mentally taxing roles was doubted from the start of the WAAF's formation. However, as the war progressed and situations became more dire, the strain the RAF was under led them to place women in roles previously thought unfathomable, including telephony, telegraphy and intercepting codes and ciphers. Women also entered the male-dominated worlds of mechanics and engineering.

A common posting for WAAF members was to work in the radar control systems as reporters and plotters. Several roles, however, were unavailable to women, such as actually serving as a pilot, although women did fly military aircraft in the capacity of the Air Transport Auxiliary (ATA). Over 150 women flew with the ATA during the war, delivering new planes from factories to RAF units and taking planes back for repairs. Because the RAF thought it unacceptable for women pilots to fly military aircraft, all ATA female members were civilians. The Under Secretary of State of Air, Lord Balfour, later commented that "the Air Transport Auxiliary were civilians in uniforms who played a soldier's part in the Battle for Britain".

The WAAFs were a vital resource during the Battle of Britain. One role of immense importance was the operation of barrage balloon sites. This required raising and lowering the balloons, which were designed to deter enemy bombers by floating above the potential targets of raids. This would force the German pilots to fly at a higher altitude and impact the accuracy of their bombing. The balloons also had the additional benefit of bringing

The Nursing Orderlies were responsible for evacuating the wounded from France



Image source: Wiki



THE WOMEN'S AUXILIARY AIR FORCE

The WAAF's
contributions were
essential in keeping
the RAF flying



Image source: Getty



WAAFs played essential roles at RAF Fighter Command during the Battle of Britain



Image source: Wiki

“THE WORK OF WAAF PLOTTERS WAS OF IMMENSE IMPORTANCE DURING THE BATTLE OF BRITAIN”

the aircraft in range of anti-aircraft guns. Initially, women were believed to not have the physical strength and stamina required to fulfil such a role, due to the 66-foot-long and 30-foot-high balloons. It was also very challenging to keep the balloons not only inflated but in position, particularly during bad weather. However, the initial female volunteers smashed expectations, operating the sites with skill and speed. Eventually over 1,000 barrage balloon sites were operated by women throughout Britain.

The work of WAAF plotters was of immense importance during the Battle of Britain. Based in the sector station operations rooms, the plotters worked in teams of ten, meticulously tracking the direction and size of incoming German raids. Wooden blocks placed around a large table would chart the raids, listing the name and strength of the incoming units, as well as the direction they were coming from, in the form of arrows placed behind each block. They were also colour coded to denote how fresh the information was. This allowed a quick and comprehensive view of the most dangerous and time-critical threats to the nation. The men seated above the plotters would use the information provided by the women to direct squadrons into action and communicate the vital information to other squadrons.

During the summer of 1940 there were thousands of WAAFs placed in Fighter Command

airbases across the country to assist in the Dowding System of defence, including bases at Manston, Hawkring and Biggin Hill. These were especially dangerous places to work, as they were often prime targets for Luftwaffe bombs during the Battle of Britain. One of the worst-affected bases was RAF Biggin Hill in Kent, which saw 39 people killed in one attack on 30 August. WAAF members Sergeant Joan Mortimer, Flight Officer Elspeth Henderson and Sergeant Helen Turner all worked at Biggin Hill as teleprinter operators. On 1 September 1940 the base came under heavy attack from the Luftwaffe while the women were inside the building. Showing immense bravery, Turner continued to work the switchboard even as the building was falling down around her, while Henderson kept in contact with Fighter Command Headquarters in Uxbridge, even after she was knocked to the ground when the operations room took a direct hit. Both women worked tirelessly through the night to keep the station operational. The two WAAFs were so determined to help their country that they only abandoned their posts when a fire broke out and they were ordered to leave.

Meanwhile, Mortimer was in the armoury when the raid began. This was an incredibly dangerous place to be as the room was packed with tons of high explosives. Despite this, she stayed put at the telephone switchboard, ensuring that messages could be relayed to the defence posts near the airfield. When the situation became dire, Mortimer snatched a handful of red flags and hurried outside, marking all the unexploded bombs scattered around the building. Even a bomb exploding nearby didn't stop her. All three women



Image source: Alamy



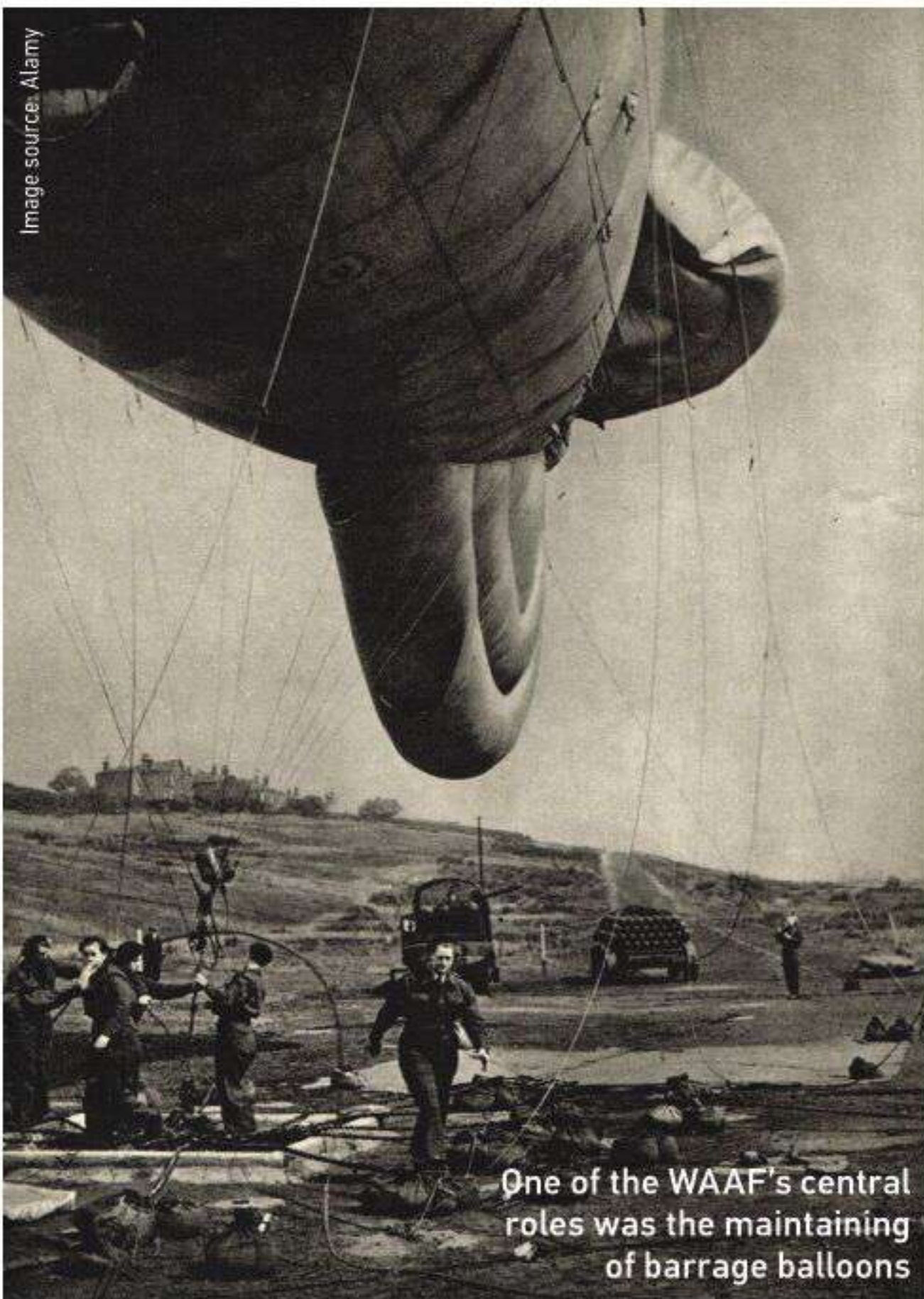
Image source: Getty

Top: By 1945 a quarter of a million women had served in the WAAF in over 110 different roles

Above: At its peak strength, over 2,000 women were enlisting in the WAAF every week

were awarded military medals in November 1940 for their courage.

An additional branch of the WAAF were the Nursing Orderlies. These women would fly on RAF transport planes, putting themselves in immense danger in order to help evacuate the wounded from the battlefields of Normandy. Nicknamed 'Flying Nightingales', this team of nurses would administer oxygen, injections and deal with injuries such as missing limbs, head trauma, broken bones and burns. The Flying Nightingales brought back almost 100,000 wounded soldiers from Europe to Britain. They also carried vital supplies to the battlefield. An incredibly risky role, the women were given parachutes on the flight out, but on the way back they were ordered to stay



One of the WAAF's central roles was the maintaining of barrage balloons

with the plane and treat the survivors, and the parachutes were locked away. The planes were so full with casualties that the nurses would have to stand the entire journey back. These women could not be recognised as being RAF nurses, else they would have had held the rank of officer. For all intents and purposes they were volunteers and regarded as civilians in uniforms, with no rank and no medals. For decades, the bravery and sacrifice of these nurses went unacknowledged, however, in October 2008 the Duchess of Cornwall awarded the seven WAAF nurses still living lifetime achievement awards for their service to the nation.

It is nigh on impossible to overestimate how vital the WAAF was to the war effort, especially during the Battle of Britain. At its peak, the WAAF had over 180,000 members and was recruiting 2,000 women per week. At RAF Uxbridge, responsible for commanding all of the aircraft in the southeast, 85 per cent of the staff in the bunker were WAFs.

Despite their remarkable contribution, WAFs were only paid two-thirds as much as their male counterparts. Without the bravery and dedication of the WAAF, it is of no doubt that the RAF would have been unable to cover all the necessary roles required, therefore ultimately jeopardising the chances of victory in the Battle of Britain. For women this was a huge achievement, not only in terms of the war effort, but also in regards to their place in society. While previously their capability to contribute had been in doubt, the women's tireless work during the conflict finally proved they were capable of aiding in the British war effort.

Six military medals were awarded to WAFs for their courage and exceptional service, but for many, the WAFs' greatest contribution was the support they provided, which was crucial when the bombs began to fly. Members of the WAAF served not only in Britain but also the US, Egypt and across Europe. In 1949 the WAAF was re-formed into the Women's Royal Air Force, and in 1994 it was fully integrated into the RAF. Today, women fulfil all roles within the air force, including, in 2017, the RAF Regiment, with the first women joining the specialist corps in January 2020.



BRITAIN'S MUSLIM HEROINE

THE BRITISH SPY WHO MADE THE ULTIMATE SACRIFICE TO FIGHT TYRANNY

Born in Moscow on the dawn of the new year in 1914, Noor Inayat Khan was a descendant of Indian Muslim nobility but would go on to make a name for herself through her own bravery.

Khan first lived in England, then moved to France. When the country fell to German troops Khan fled back to England. At heart a pacifist, she was influenced by the teachings of Gandhi. It was this love of peace that motivated her to play a role in defeating the tyranny of the Nazis. This desire for justice led her to join the WAAF in November 1940.

After two years of training Khan was flown to France to become an operator in occupied territory, the first woman sent there for this role. Khan's superiors had their doubts about her suitability, saying that she was unstable and temperamental and "not overburdened with brains", but they did praise her hard work ethic. However, in the field, Khan's experience in playing the harp gave her an edge, working with impressive speed and accuracy.

Khan's job was one of the most dangerous of all – to send and receive messages about sabotage operations and where to send weapons for resistance fighters. The operators were at great risk of detection, a possibility that only became more likely as the war progressed. Khan had to take on a new identity, that of children's nurse 'Jeanne-Marie Renier', but to her colleagues she had the codename 'Madeleine'. Despite multiple members of the network being arrested, Khan remained in the resistance, moving from place to place to avoid capture.

Sadly, this only lasted the summer. In October 1943, Khan was betrayed by one of two French women; either a double agent, or a spurned



For her courage in the face of evil Khan was posthumously awarded the George Cross

lover who lost the affections of a man she liked to Khan. Either way, Khan was captured by the Gestapo, who used the operator's secret signals to trick London into sending more agents into their waiting hands. Khan did manage to escape from prison but was arrested within a few hours. By November 1943 she was transferred to Pforzheim prison, where she was classed as highly dangerous and kept in chains.

Despite her horrendous treatment, Khan resisted revealing any information. By September 1944, the Gestapo gave up their interrogations and sent her to Dachau, where she was executed by being shot. Her last word was reported as 'Liberté'.

"KHAN'S JOB WAS ONE OF THE MOST DANGEROUS OF ALL – TO SEND AND RECEIVE MESSAGES ABOUT SABOTAGE OPERATIONS"



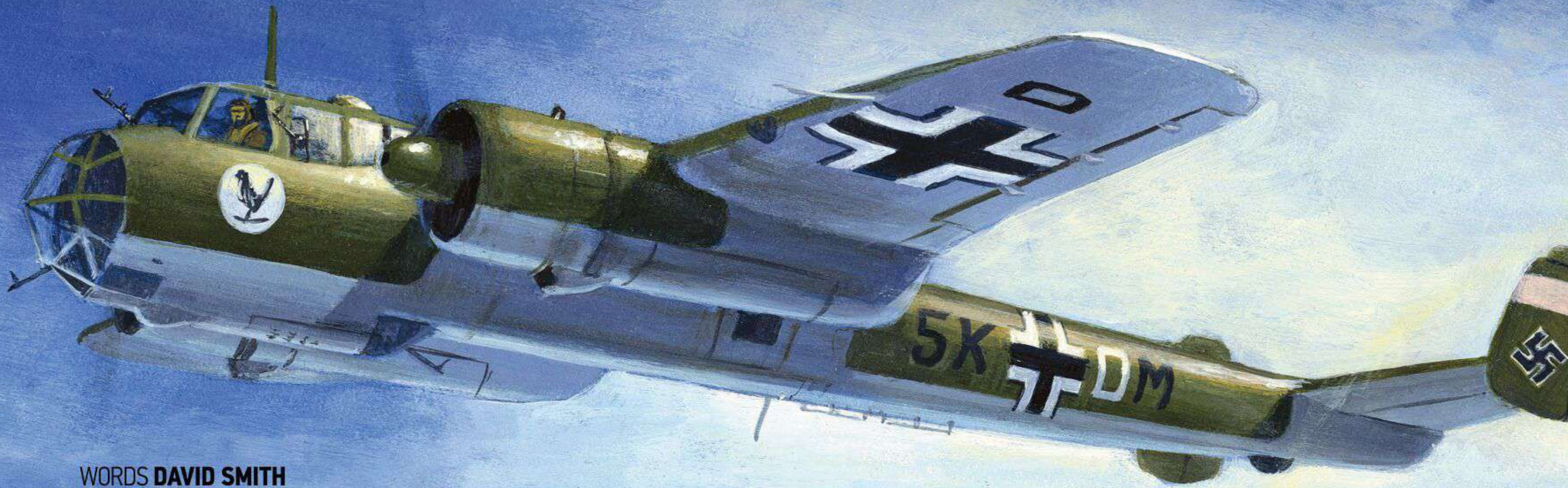
Members of the WAAF were also taught self-defence



DEATH FROM ON HIGH

THE UNSUNG HEROES OF THE BATTLE OF BRITAIN

303 SQUADRON



WORDS DAVID SMITH

Among the deadliest but least-celebrated pilots to fight the Luftwaffe during Britain's time of need were Poland's fighter aces. This is the story of their finest hour

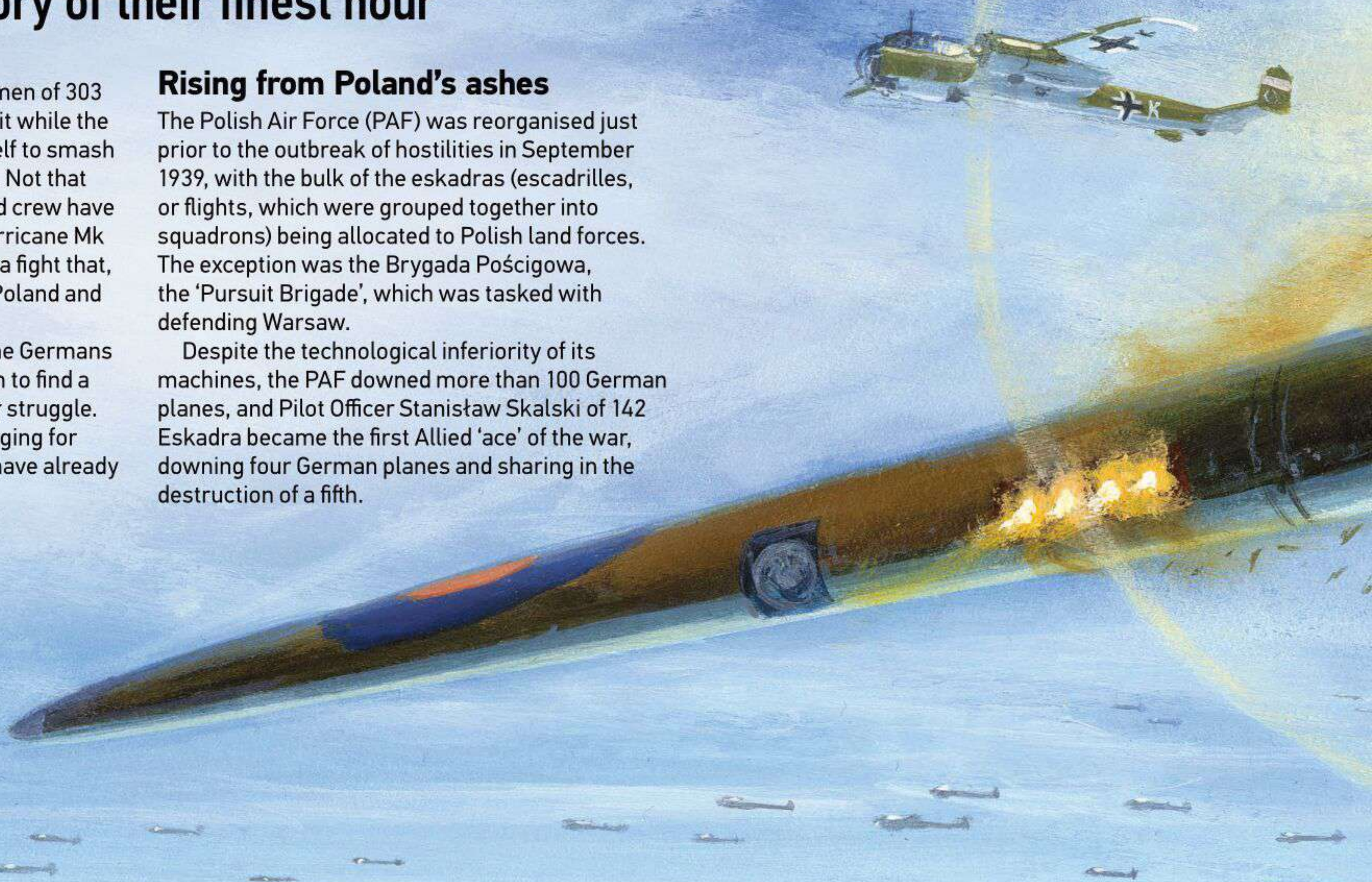
August 1940. For three weeks the men of 303 Squadron have been forced to wait while the German war machine readies itself to smash the last resistance in Western Europe. Not that they have been idle – pilots and ground crew have been training hard to operate their Hurricane Mk Is, and they are nearly ready to renew a fight that, for them, began in their homeland of Poland and continued in France.

Everywhere the Poles have been, the Germans have proved inescapable, forcing them to find a new base from which to continue their struggle. The Battle of Britain may have been raging for weeks, but the men of 303 Squadron have already been fighting for a year.

Rising from Poland's ashes

The Polish Air Force (PAF) was reorganised just prior to the outbreak of hostilities in September 1939, with the bulk of the eskadras (escadrilles, or flights, which were grouped together into squadrons) being allocated to Polish land forces. The exception was the Brygada Pościgowa, the 'Pursuit Brigade', which was tasked with defending Warsaw.

Despite the technological inferiority of its machines, the PAF downed more than 100 German planes, and Pilot Officer Stanisław Skalski of 142 Eskadra became the first Allied 'ace' of the war, downing four German planes and sharing in the destruction of a fifth.



**"THE BATTLE OF BRITAIN MAY HAVE BEEN RAGING
FOR WEEKS, BUT THE MEN OF 303 SQUADRON HAVE
ALREADY BEEN FIGHTING FOR A YEAR"**





DEATH FROM ON HIGH

As the Polish armed forces fell back before the German advance, they could count on the forests and marshland in eastern Poland to slow their enemy down on the ground, while new planes (including Hurricanes) were expected to arrive via neutral Romania at any moment to match the Germans in the air. Such hope was dashed on 17 September when the Soviet Union invaded Poland from the east. The next day, the remaining PAF forces were ordered to make their way as best they could to Romania or Hungary. It was to be just the first step of a long journey. From their temporary havens the Polish pilots headed for France, mostly by ship (the few P.11s that had been flown to Romania were left there), and quickly started preparations for the next stage of their war against Germany.

Some Polish forces, perhaps recognising the likelihood of German success in France, headed immediately for Britain. However, most pilots and air crew started frantic retraining on the Morane-Saulnier MS.406 – a plane with a passing resemblance to the Hurricanes the men of 303 Squadron would fly with such distinction during the Battle of Britain.

A total of 130 Polish pilots took part in the Battle of France, with many serving in the 'Montpellier Squadron' (so called because that was where they had undertaken their conversion courses for the MS.406), which was divided between several French formations.

The willingness of the Polish to fight wherever and whenever was exemplified by a squadron that trained in France in order to fight against the Russians in Finland. Before they could be transferred, however, the Finns made their separate peace with the Soviet Union on 12 March 1940. Even after being asked to fly the inferior Caudron-Renault C.714 Cyclone, a seriously underpowered plane with a wooden frame, the Polish pilots stubbornly persevered.

Below: Members of 303 Squadron after returning from a sortie in October 1940

French authorities declared the plane unfit for combat after early negative feedback, but with no alternatives available the pilots flew on.

Of course, the end of this chapter came quickly. Having been credited with the destruction of 60 German planes (at a cost of 13 pilots killed), the Polish airmen were on the move once more after France surrendered. Scattering in any planes they could get their hands on or making their way to French ports, the men headed for Marseilles, La Rochelle, North Africa and Gibraltar. Their routes may have been varied, but their destination was always the same – as far as they were concerned, there was simply nowhere else to go.

The island of last hope

The Polish airmen had put up a brave fight in their homeland and in France, and they could have headed for the US or Canada with their pride intact. But only one nation still offered the prospect of continued combat operations against the Germans.

Despite this, Britain was a very different experience for the Poles. Where they had enjoyed their own 'special relationship' with the French, which meant that most of them spoke excellent French, many of them spoke little or no English. The French method of spreading Polish pilots through existing squadrons would be problematic in the RAF, but that was how the first men to arrive made their contributions.

Some of those who had moved on to Britain soon after reaching France were already in training. Fighter aces were even prepared to take up posts in bomber squadrons, so keen were they to keep fighting. This enthusiasm led to one of the many myths about the Polish Air Force – that their personnel were brave but reckless, and that they paid a heavy price for it.

The Polish fighters were indeed brave, and their preferred tactic – closing to extremely close range

Top: This Polish propaganda poster told the country its air force was 'strong, serried, ready'
Right: A 1939 British tabloid report on the Polish Air Force bombing Berlin



"SOME POLISH FORCES, PERHAPS RECOGNISING THE LIKELIHOOD OF GERMAN SUCCESS IN FRANCE, HEADED IMMEDIATELY FOR BRITAIN"

before opening fire on an enemy – appeared to the British to be quixotic.

It would take some time for this misapprehension to be remedied and for the Polish airmen to be recognised for what they were – some of the best pilots available to the RAF. Their experience was valued from the start, but it was with British units that they made their first telling contributions.

Of course, their support was badly needed. Britain, anticipating a major air confrontation with Germany, had been investing heavily in its air force since 1937, but when war came it did not follow the expected pattern. German military planning was not based on massive strikes from the air but on tight co-operation between air and land forces. The nightmare of bombing raids against cities was not part of the plan – it was only to be considered in retaliation for similar raids. Britain's army was small at the outbreak of war and was unable to make a difference on the continent.

The RAF, which had envisioned flying over home ground with the benefit of radar, was much less effective when shorn of these two major advantages. No fewer than 477 fighters and 284 pilots were lost in France. Fighter Command's Sir Hugh Dowding begged the War Cabinet to stop sending his precious planes over the Channel. Spitfires were not committed until the evacuation at Dunkirk, but even so the British lost 155 of their premier aircraft.

However, the war was about to enter a phase that the British had been planning for – a defensive struggle to prevent an invasion. On 18 June, Winston Churchill christened the battle to come when he declared, "The Battle of France is over. I expect the Battle of Britain is about to begin."

Polish fliers were airborne with RAF squadrons as early as July 1940, with the first kill credited to Flying Officer Antoni Ostowicz on 19 July when in action with 145 Squadron. In one of war's many cruel ironies, Ostowicz was also the first Polish pilot to be killed in the Battle of Britain.

Nearly 100 Polish pilots flew with 27 fighter squadrons, moving from one unit to another as needed. They would undoubtedly have been willing to continue in this manner, but it was quickly realised that they could be more effective in dedicated Polish squadrons, where the language barrier and the differences in operational doctrine would not be an issue.

Giving the Poles their own squadrons would also enable them to keep alive the unit histories that meant so much to soldiers, sailors and airmen. It meant that 303 Squadron, the fourth Polish squadron to be formed, was able to resurrect the 'City of Warsaw' name that it had carried when part of the Pursuit Brigade. The squadron's roots, however, ran even deeper than this.

Rise of the Kościuszko Squadron

Following World War I, Poland emerged from more than 100 years of partition to be an independent nation once more. The Polish-Bolshevik War, however, threatened to end this almost immediately, with Lenin intent on



THE PURSUIT BRIGADE

HOW THE POLISH AIR FORCE TOOK THE FIRST FIGHT TO THE LUFTWAFFE IN 1939

One of the myths of the war, propagated by the Nazis, was that the Polish Air Force had been destroyed on the ground in the first two days of the German invasion. In fact, the Poles had known what was coming and had moved their fighters to new bases before the Germans struck. The problem was that those fighters were badly outperformed by their German counterparts and even struggled to compete with bombers.

The Pursuit Brigade (Brygada Pościgowa) was comprised of two squadrons tasked with defending Warsaw. Three units, 113, 114 and 123, made up IV/1 Dywizjon (Squadron), based about 11 kilometres (seven miles) north of Warsaw.

Operating from a base about five kilometres (three miles) northeast of Warsaw, III/1 Dywizjon

comprised 111 and 112 eskadras. The famed 303 Squadron would largely be made up of pilots from this unit. Most of the pilots in the Pursuit Brigade flew PZL P.11 fighter aircraft, although 123 Eskadra had to make do with P.7s. Less than a decade old when the war opened, the P.11 had nevertheless been rendered nearly obsolete by modern developments in fighter technology. It had a distinctly old-world look, with its open cockpit and fixed undercarriage.

Unable to catch German planes from behind (its top speed was just 390 kilometres (242 miles) per hour), P.11 pilots were forced to tackle them head-on, and the relative weakness of the P.11 armament (two or four 7.92mm machine guns) meant that they had to close to the sort of ranges that would have made an RAF pilot blanche to have a chance of downing an enemy.

Seriously outnumbered as well, it is no surprise that the PAF lost about 85 per cent of its aircraft during Poland's brief war, but it also claimed more than 100 kills, and the experience gained by the pilots was to prove invaluable in France and Britain.

"THE P.11 HAD BEEN RENDERED NEARLY OBSOLETE BY MODERN DEVELOPMENTS IN FIGHTER TECHNOLOGY"



A Stuka dive bomber claimed the first kill of the war in Poland, downing a P.11 as it was taking off



The PZL P.11c may have been slow and lightly armed, but it was a tough plane with an all-metal construction





A group of pilots rush to their planes as the order to take off is sounded



DEATH FROM ON HIGH

absorbing the country within the Soviet Union. Help for Poland came from many quarters, but perhaps the most remarkable was the squadron of American volunteer pilots formed by Merian Cooper. Taking their place in the Polish Air Service as the 7th Squadron, they were nicknamed the 'Kościuszko Squadron', after a Polish general who had served with the Americans during the War of Independence (1775–1783). The squadron's badge, designed by American pilot Elliott Chess, combined American and Polish elements such as red and white stripes and 13 blue stars (representing the original 13 American states) into an eye-catching emblem.

Following the distinguished service of the American pilots (three of whom died during the war), the Kościuszko name was taken on by 111 Eskadra, part of the Pursuit Brigade, which in turn provided the basis for 303 Squadron. It was an illustrious history, based on the willingness of foreign pilots to fly in another nation's air force. It is difficult to imagine a more fitting background for the determined men who started training in Britain in August 1940.

The men of 303 Squadron were immortalised in a book by Arkady Fiedler. While many unit histories are written long after the events, with aging veterans recalling their days of service, *303 Squadron* is a very different text. Written during the Battle of Britain, it has an immediacy that instantly grips the reader. Fiedler was an emotive and emotional writer, but even the occasionally overblown rhetoric cannot alter the fact that he offered a fascinating glimpse inside the workings of a fighter squadron under the highest possible

"IT WOULD TAKE SOME TIME FOR THIS MISAPPREHENSION TO BE REMEDIED AND FOR THE POLISH AIRMEN TO BE RECOGNISED FOR WHAT THEY WERE – SOME OF THE BEST PILOTS AVAILABLE TO THE RAF"

stress and inside the workings of the fighter pilot's mind as well.

"The more-sensitive fighter pilots," Fiedler wrote, "clearly feel that their nerve ends reach to the tips of their aircraft's wings. They feel them physically and emotionally. If an enemy damages one of their wings, they feel the shock as if they had been wounded themselves."

Fiedler also debunked another of the myths surrounding the Polish airmen – that they were consumed with rage when in the air. The young Polish pilots were, of course, hugely motivated by experiences in their home country, but in the air they were calm, their minds blank as instinct took over and they experienced "a sort of mental blackout." Only in this state could they hope to react quickly enough to survive.

The men of 303 Squadron did not have to wait for their training to officially end before taking the fight to the Germans. On 31 August, the last day of their conversion course to fly Hurricanes, they were 'vectored' onto a formation of German

planes. Bombers and their fighter escort were returning after a raid when 303 Squadron found them. Five kills were made quickly, while a sixth was added by Lieutenant Zdzisław Henneberg after he had patiently followed a group of four retreating planes. Six kills, all Messerschmitt Bf 109s, had announced the arrival of the squadron in no uncertain terms, and their admission to the official strength of the RAF was timely – German strategy had recently shifted to targeting Fighter Command specifically.

The Luftwaffe attacks

Just as the shift to an air-based strategy suited the British, it caused serious problems for the Germans, who were used to combining their air and ground forces – independent air operations presented a new challenge. Famously, the British benefited from radar technology, but a far more prosaic system of ground-based observers was also available to Fighter Command.

German tactics initially involved flights of Bf 110s (twin-engine heavy fighters), which were supposed to lure in British fighter units and leave the way clear for the bombers and their single-seater fighter escorts. However, the 110s suffered so badly they required their own escorts, nullifying their effectiveness. The ultimate symbol of the German way of warfare, the Stuka dive bomber, also proved unsuitable for a role in the Battle of Britain. German bombers, meanwhile, especially the Junkers Ju 88, were good planes, but their payloads were small (the Ju 88 could carry 4,000 pounds of bombs, while the Lancaster would haul up to five times as much on its missions).



Hawker Hurricanes fly in formation

Ferić (far left) with other members of 303 Squadron at RAF Northolt



“FOLLOWING THE BATTLE OF BRITAIN, FERİĆ FOUGHT ON IN SPITFIRES, DESTROYING ONE MORE BF 109”

THE ULTIMATE SACRIFICE



MIROSLAW FERİĆ SURVIVED INVASION, EVACUATION AND THE BATTLE OF BRITAIN BEFORE FINALLY LAYING DOWN HIS LIFE IN AN RAF UNIFORM

Born in 1915 near Sarajevo, Ferić moved to Poland in 1919 and fought as part of the Pursuit Brigade during the German invasion of 1939. He shared in two kills but also only narrowly escaped death when forced to take to his parachute after another sortie. He fled to Romania on 17 September and then on to France, where he fought under Zdzisław Krasnodębski, who was also to become his commanding officer in 303 Squadron.

As well as destroying six German planes during the Battle of Britain he also somehow found time to set up a squadron diary, the *303 Squadron Chronicle*, which has proved invaluable for students of the unit.

Following the Battle of Britain, Ferić fought on in Spitfires, destroying a Bf 109 and damaging another before he was killed in an accident on 14 February 1942. Awarded the Silver Cross of the Virtuti Militari, as well as the Cross of Valour (with two bars) and the British DFC, Ferić is buried in Northwood Cemetery in Middlesex.

German high command appeared unsure over what strategy to pursue, targeting coastal defences, shipping and cities as well as fighter bases, but the overall aim was consistent, at least as far as the Luftwaffe itself was concerned – it was aiming to knock out Fighter Command. German bombers were initially expected to manage with only small escorts as the fighters engaged their RAF counterparts. The RAF, however, prioritised attacks on the bomber formations, forcing the Germans to unite bomber with fighter into the sort of mixed formations that have become symbolic of the battle. The formations presented a big target to the pilots of 303 Squadron when they burst onto the scene on 31 August, and they lost no time in taking full advantage of the situation.

Wonderful madmen

The successes of 303 Squadron during the Battle of Britain were so remarkable that some began to question the accuracy of their figures. Was it really possible for a group of reckless Poles to be outperforming every other RAF squadron? The group captain at RAF Northolt, Stanley Vincent, wanted to be sure and accompanied the squadron on a sortie flown on 5 September. He could hardly have chosen a better day. The nine Hurricanes that 303 Squadron could put in the air that day accounted for eight German planes to the loss of just one, and all their pilots returned safely. Vincent was amazed and delighted, calling his Poles ‘wonderful madmen’.

The dash and courage of the Polish squadron could not be denied, but following one of its greatest days it then suffered through one of its most costly on 6 September. One pilot was killed, five Hurricanes destroyed and Major Zdzisław

The Regia aeronautica, the Italian air force, also took part in the Battle of Britain





DEATH FROM ON HIGH

Krasnodębski suffered severe facial burns after his plane was hit. Despite the terrible losses, the day was a triumph for the squadron – a defensive action that saw its nine Hurricanes occupy huge numbers of German fighters and help to break up a major assault.

By stripping a massive bomber formation of its cover, 303 Squadron had allowed other units to get at the bombers themselves. Being a fighter pilot wasn't always about attacking, as Fiedler realised. "A fighter pilot's skill is displayed not only in the offensive, but also in the defensive role," he wrote. "Above all, in the defensive role. While every soldier is easily able to take cover from enemy fire, a fighter pilot at an altitude of 20,000 feet has nothing but empty sky around him. Only lightning manoeuvres and exceptional, superhuman presence of mind can save him."

The Battle of Britain played out in this fashion. Sometimes the men of 303 Squadron attacked, sometimes they defended – always they were pushed to the limit. The unsung heroes of the squadron, the ground crews (memorably described by Fiedler as the "colourless roots of brilliant flowers") allowed the pilots to be sure of at least one thing as they ran to their Hurricanes: the planes would not let them down. Despite the almost constant action, the ground crews of 303 Squadron failed to put 12 planes into the air on just four occasions. It wasn't always the same 12 planes. It wasn't always the same 12 pilots. The battle took a terrible toll on both groups, but the squadron was handing out more punishment than it was taking.

12 Dorniers were shot down on 7 September for the loss of two Hurricanes, with other British



The mascot of 303 Squadron, Misia, sits atop the 178th German aircraft downed by the unit

"SOMETIMES THE MEN OF 303 SQUADRON ATTACKED, SOMETIMES THEY DEFENDED – ALWAYS THEY WERE PUSHED TO THE LIMIT"

squadrons accounting for 61 planes and anti-aircraft fire destroying another 28.

Then came a dizzying 15 minutes on 11 September, a quarter of an hour in which the squadron scored 17 kills when engaging an airborne armada of 60 bombers, 40 Bf 110s and 50 Bf 109s. The first section of 303 Squadron (three planes) bypassed the fighters and headed straight for the bomber formation. The second section held the German fighters at bay, allowing the third to

also target the bombers. Finally, the fourth section joined in the holding action against the fighters.

It was arguably the squadron's finest hour, but it came at a cost. Ground crews at Biggin Hill watched in appalled fascination as Sergeant Stefan Wójtowicz fought alone against nine Bf 109s, shooting two down before his plane was hit. Also dying that day was Arsen Cebrzyński, killed by machine-gun fire from a German bomber. RAF losses on the day totalled 24 planes and 17 pilots as well as the two fatalities in 303 Squadron.

By 15 September, the day that is now commemorated as Battle of Britain Day, the toll on 303 Squadron had become almost too much to bear. Three sorties were flown, but the grinding reality of the near-cessless combat was made clear by the number of planes that took part in each: 12 Hurricanes took to the air in the first sortie, nine in the second and just four in the third. Despite this, the Polish ground crews had 12 Hurricanes ready for action by dawn the following day. The 'wonderful madmen' had a supporting cast every bit as important as they were.

'I have fought a good fight'

The pilots of 303 Squadron were not exclusively Polish. Two Brits, one Canadian and one Slovakian also flew with the squadron, alongside one of the most intriguing characters of the entire war, the Czech pilot Josef František.

Unable to control his instincts when in the air, František would leave his formation shortly after take off and head for the Channel, where he would wait alone to ambush returning German planes flying back to France after their missions. Perfecting this technique to the level of an art form (the Polish pilots called it the 'František method'), he scored 17 kills in the Battle of Britain to add to ten from the Battle of France, but his mental state gradually unwound due to the intense and unrelenting pressure and he eventually died in tragically needless circumstances, crashing his plane while executing a victory roll on 8 October 1940 over Ewell, Surrey.

The squadron remains most famous, however, for its 37 Polish pilots, nine of whom died in the six



HURRICANE MK I

LIVING IN THE SHADOW OF THE MORE ILLUSTRIOUS SPITFIRE, THE HURRICANE WAS ARGUABLY THE BACKBONE OF THE RAF DURING THE BATTLE OF BRITAIN

The Hurricane comprised 55 per cent of Fighter Command's single-seat fighter force during the Battle of Britain. It was not as fast as the Spitfire (523 kilometres (325 miles) per hour compared to over 563 kilometres (350 miles) per hour), but it made up for this by being a more robust machine. From mid-August, Hurricanes were encouraged to concentrate on attacking German bomber formations, with Spitfires handling the fighter escorts.

It's Achilles' heel, one that cost 303 Squadron's Zdzisław Krasnodębski dearly, was the lack of a self-sealing fuel tank. This defect was gradually rectified as the Battle of Britain progressed, but unmodified Hurricanes were prone to erupting in flames if hit in the fuselage-based tank.

The Hurricane's eight .303 machine guns also struggled against the tough armour of the German fighters, and a mixture of incendiary and armour-piercing shells was used as well in an effort to compensate.

Propeller modifications were also introduced through the battle, adding to the Hurricane's ceiling and boosting general performance.

"IT WAS NOT AS FAST AS THE SPITFIRE, BUT IT MADE UP FOR THIS BY BEING A MORE ROBUST MACHINE"

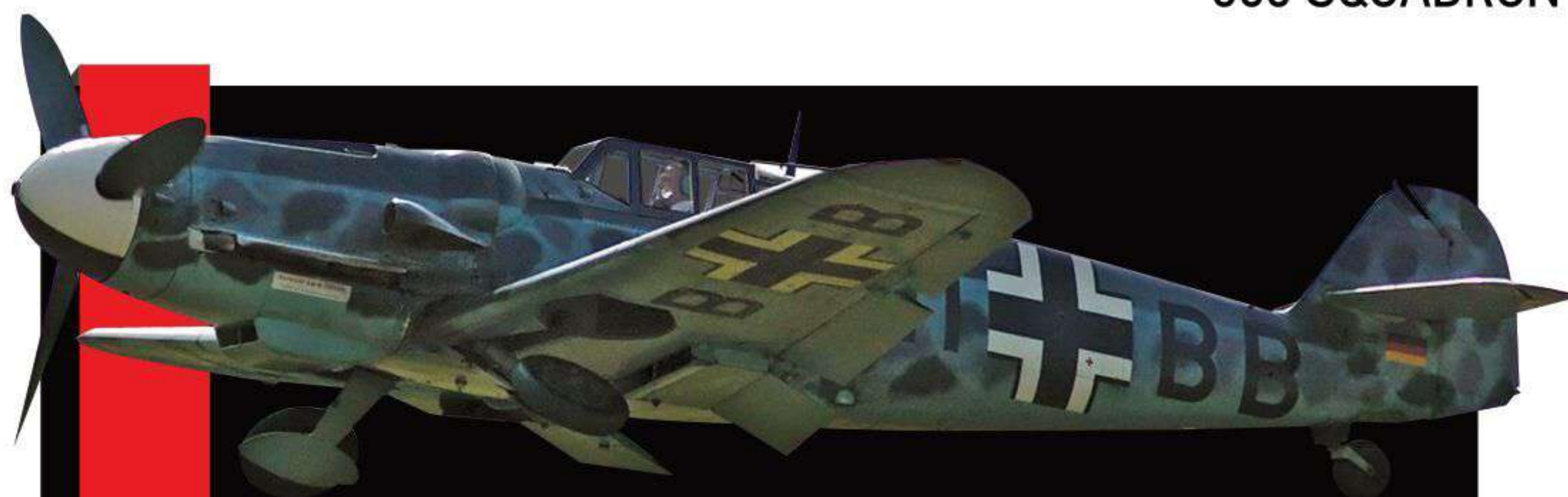


weeks the squadron was operational during the battle. During those six weeks they shot down 126 German planes, the highest total of any squadron in the RAF. No less an authority than Dowding at Fighter Command recognised the tremendous contribution made by the foreign pilots when he said, "Had it not been for the magnificent material contributed by the Polish squadrons and their unsurpassed gallantry, I hesitate to say that the outcome of the battle would have been the same."

The Polish pilots within the RAF had at times appeared to be almost unstoppable. Sergeant Antoni Głowacki, of 501 Squadron, downed five German planes on 28 August, becoming an 'ace in a day', while 303 Squadron's Witold Urbanowicz was known as the 'ace of aces', once shooting down nine German planes in three days of action at the end of September. He finished with 15 victories to become the most successful Polish pilot of the Battle of Britain.

Although the battle was not to officially end until 30 October, 303 Squadron's contribution came to a conclusion on the 11th of that month when the exhausted men were moved to RAF Leconfield in East Yorkshire for some badly needed respite. But the squadron's war was far from over. It would return to action in 1941, this time with its pilots in the cockpits of Spitfires.

The memorial to the Polish airmen who fought during World War II was unveiled at RAF Northolt in 1948, carrying the names of the 2,408 men who gave their lives and bearing a simple but poignant inscription: "I have fought a good fight, I have finished my course, I have kept the faith."



MESSERSCHMITT BF 109

THE GERMANS' PREMIER FIGHTER IN THE BATTLE OF BRITAIN WAS A SUPERB ALL-ROUNDER AND A WORTHY OPPONENT FOR THE HURRICANE AND SPITFIRE

The Messerschmitt Bf 109 could make a credible claim to being the best fighter in the skies during the Battle of Britain.

The superior armament of the 109 (a pair of 20mm cannons were teamed with two 7.9mm machine guns) gave them a hefty punch, while they enjoyed significant performance advantages over both Hurricanes and Spitfires at higher altitudes. Richard Overy has claimed that "if the Battle of Britain had been fought at 30,000 feet, the RAF would have lost it".

The 109 also benefitted from extensive armour, added prior to the Battle of Britain, which protected the pilot, but it could not turn as tightly as the British fighters and the Germans also suffered badly in the logistical department;

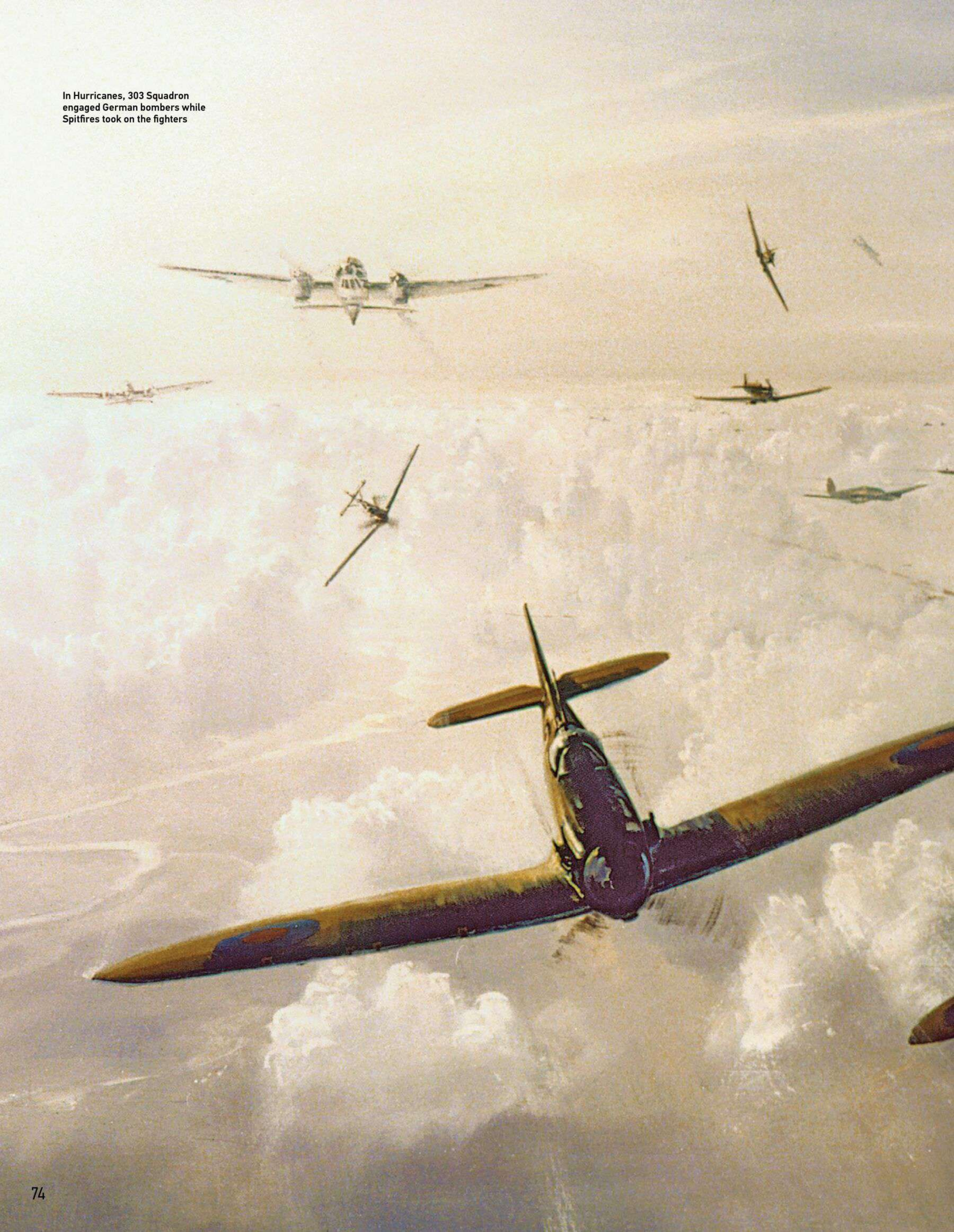
damaged planes often had to be returned to Germany for repair and aircraft production never hit targets. Only 775 109s were produced during the critical four-month period from June to September 1940.

"THE MESSERSCHMITT BF 109 COULD MAKE A CREDIBLE CLAIM TO BEING THE BEST FIGHTER IN THE SKIES DURING THE BATTLE OF BRITAIN"

Front row from left: Polish flying ace Jan Zumbach, Wing Commander Stefan Witorzeń and Flight Lieutenant Zygmunt Bieńkowski of 303 Squadron



In Hurricanes, 303 Squadron
engaged German bombers while
Spitfires took on the fighters




**"HAD IT NOT BEEN FOR THE MAGNIFICENT MATERIAL
CONTRIBUTED BY THE POLISH SQUADRONS AND THEIR
UNSURPASSED GALLANTRY, I HESITATE TO SAY THAT THE
OUTCOME OF THE BATTLE WOULD HAVE BEEN THE SAME"**

AIR CHIEF MARSHAL HUGH DOWDING







TWO GERMAN PILOTS (IN THE FOREGROUND) WHO BAILED OUT OVER SUSSEX ARE MARCHED INTO CAPTIVITY BY MEMBERS OF THE HOME GUARD. THE WRECKAGE OF THEIR DOWNED HEINKEL HE 111 BOMBER SMOULDERS IN THE BACKGROUND.



DEATH FROM ON HIGH

MESSERSCHMITT BF 109G

Take a tour around one of World War II's most iconic aircraft and the backbone of the Third Reich's Luftwaffe

WORDS NEILL WATSON



MESSERSCHMITT BF 109G

CREW	1
LENGTH	8.95M (29FT 7IN)
WINGSPAN	9.925M (32FT 6IN)
HEIGHT	2.6M (8FT 2IN)
WING AREA	16.05M ² (173.3FT ²)
EMPTY WEIGHT	2,247KG (5,893LB)
LOADED WEIGHT	3,148KG (6,940LB)
MAX TAKEOFF WEIGHT	3,400KG (7,495LB)
POWERPLANT	1 X DAIMLER-BENZ DB 605A-1 LIQUID-COOLED INVERTED V12, 1,455HP (1,085KW)
PROPELLERS	VDM 9-12087 THREE-BLADED LIGHT-ALLOY PROPELLER
PROPELLER DIAMETER	3M (9FT 10IN)

“WHILE ULTIMATELY NOT THE VERY BEST FIGHTING PLATFORM BY 1945, IT WAS BUILT IN HUGE NUMBERS, WITH MORE THAN 33,000 CONSTRUCTED BETWEEN 1937 AND 1945”



Though designed as a short-range interceptor, Bf 109 variants served in many roles across all fronts



The aircraft seen here is an accurate replica of a 1943 Bf 109G-6, with the unique pattern used by Hermann Graf of JG.50. He ended the war with 212 confirmed victories in the air

Fighting against its arch rival the Supermarine Spitfire, the Messerschmitt Bf 109 is probably the most famous Axis fighter of World War II. In the early years of the war it was the main single-engine fighter interceptor of the Luftwaffe. While the E variant began to be outclassed by the Spitfire Mk IX after the Battle of Britain and was eventually replaced by the Focke-Wulf Fw 190, the Bf 109 in fact continued to serve across all fronts of German combat right until the war's end. While ultimately not the very best fighting platform by 1945, it was

built in huge numbers, with more than 33,000 constructed between 1937 and 1945. The most numerous variant was the Bf 109G, with more than a third of all aircraft being this specification.

Originally designed as a short-range, high-speed, extremely agile interceptor, the Bf 109 was built in response to a tender by the German Reich Aviation Ministry in 1933. It was one of several specifications laid out by the Reich at the time that formed the future of the Luftwaffe as Germany prepared for war. Heinkel, Arado, BFW and Focke-Wulf

all competed for the contract. The specification was for a fighter with a top speed of more than 400 kilometres per hour at 20,000 feet but with a flight endurance of only 90 minutes. The German Blitzkrieg warfare tactics at the time anticipated that close air support behind the main advancing front would be the main area of operations.

The Bf 109 made its debut in 1935 and played an active part in the Spanish Civil War, something that gave Luftwaffe pilots a crucial initial edge of combat experience at the outset of World War II.



DEATH FROM ON HIGH

DESIGN

The Bf 109 initially had a 700-horsepower Jumo V12, but when the prototypes were ready the engines were behind schedule. The Bf 109 at first flew with a Rolls-Royce Kestrel engine, acquired by trading a Heinkel aircraft with Rolls-Royce, who needed an engine test bed.

Other advanced technologies included leading-edge slats that deployed automatically to enhance combat manoeuvring. Early test pilots were wary of the design, with on-the-limit handling in steep combat turns becoming tricky. However, once mastered, the agility gave it an edge in air-to-air combat. Other elements that pilots disliked were the undercarriage arrangement and the fact that the canopy was designed to open sideways rather than slide back, meaning that it could not be opened in flight.

However, there is little doubt that the Messerschmitt was designed to survive combat. The engine was inverted, making it more difficult to damage by ground fire, while also giving the aircraft the ability to undertake negative-G manoeuvres in ways that Merlin-engined aircraft could not follow. The radiators had two separate systems that could be shut off independently in the event of damage, which allowed the pilot to continue flying. The aircraft would even continue to fly for five minutes with no radiators, giving the pilot a chance to escape from a dogfight if his plane was damaged.

Additionally, the fuselage fuel tank was behind the pilot and also behind the armour plating, reducing the possibility of penetration by gunfire and also burns to the pilot.

The initial Jumo engines were underpowered, with the Daimler-Benz engine eventually replacing it in a major redesign of the E series. The Bf 109E 'Emil' had major structural changes to accommodate the 1,100-horsepower Daimler-Benz engine. This model formed the basis for the G 'Gustav' series from 1942 onwards.

The design by Willy Messerschmitt used cutting-edge technologies at the time to create an extremely light monoplane design. Wherever possible, the number of components was minimised, with load-bearing structures such as engine and wing mounts being combined into one assembly. The unusual aircraft landing gear was also mounted on the same structure, which gave rise to a rather odd-looking stance when on the ground. While it made the aircraft difficult to handle in landing and takeoff, it did allow the wings to be quickly removed with the gear in place, making for rapid battle damage repairs. The engine was a liquid-cooled V12, running inverted with the exhaust stacks at the bottom of the cowlings.



The unusual undercarriage layout made the Messerschmitt tricky to handle on the ground

"THE DESIGN BY WILLY MESSERSCHMITT USED CUTTING-EDGE TECHNOLOGIES AT THE TIME TO CREATE AN EXTREMELY LIGHT MONOPLANE DESIGN"



Additional cannon were added as a field modification to improve armament



This 100 per cent accurate replica of the Bf 109G can be seen on display at the Yorkshire Air Museum

PERFORMANCE

MAXIMUM SPEED	640KM/H (398MPH) AT 6,300M (20,669FT)
CRUISE SPEED	590KM/H (365MPH) AT 6,000M (19,680FT)
RANGE	850KM (528MI), 1,000KM (621MI) WITH DROP TANK
SERVICE CEILING	12,000M (39,370FT)
RATE OF CLIMB	17M/S (56FT/S)
WING LOADING	196KG/M ² (40LB/FT ²)
POWER/MASS	344W/KG (0.21HP/LB)

POWERPLANT

The Bf 109G was powered by the Daimler-Benz DB605 liquid-cooled V12 engine. This developed 1,475 brake horsepower and was the engine that would power the Messerschmitt variants for the rest of the war. The engine was a V12, inverted, liquid-cooled engine developed as a high-performance version of the earlier DB601. To keep pace with Rolls-Royce Merlin advances, this engine was designed to rev higher and run with greater supercharger boost than previously,

while still remaining reliable in combat and not overheating. The supercharger clutch was automatic, as was the electric pitch control for the propeller, giving the pilot less to worry about in the stress of combat situations.

Aviation fuel is typically 100 octane, but Daimler-Benz designed the engines to run at reduced power on lower octane fuels, even as low as 87 octane. This meant that in frontline combat, where aviation fuel may be scarce, the aircraft could continue fighting using whatever fuel could be found.

Vorsicht beim Öffnen

Kühler ist im Haubentiel eingebaut

The Daimler-Benz liquid-cooled inverted V12 was particularly robust and able to continue operating when damaged

ROLES AND DIVERSITY

Though originally designed solely as a short-range, high-performance interceptor, the Bf 109G was pressed into service in other areas. In Africa and on the Soviet front, the aircraft was frequently used for ground attack, able to carry a single bomb centrally in addition to the cannon and machine guns carried onboard. As with the Allied Supermarine Spitfire, the Bf 109 was adapted for different roles and environments. After the early A, B, C and D models, the Bf 109E was the first major overhaul, leading to the Gustav model here. A marine variant known as the T was produced in limited numbers, with additional small-scale productions of high-altitude photo-reconnaissance aircraft and even a two-seat trainer at various times.

“IN AFRICA AND ON THE SOVIET FRONT, THE AIRCRAFT WAS FREQUENTLY USED FOR GROUND ATTACK”

Mounted single bombs were carried, or alternatively drop tanks to increase range

Left and below right: These are technical drawings of the T-1 variant, intended for use on aircraft carriers

Bf 109 models served right through until the end of the war

The Bf 109G had a central cannon firing through the propellor spinner



With a side-opening canopy, the cockpit was far harder to bail out of while in flight – an understandably unpopular feature with pilots

COCKPIT

The pilot sat in a seat designed to be used with a parachute. Armour plating behind him also covered the rear fuel tank for additional protection. Ahead was a bulletproof windscreen. The central-mounted cannon was also visible in the cockpit, which must have been deafening when in use. Pilots often criticised the cockpit canopy, both for the shallow frame that obscured vision and the fact that it hinged open sideways, meaning that it could not be opened in flight. In keeping with the compact design philosophy of Willy Messerschmitt, the cockpit was a tight fit.

ARMAMENT

The thin, high-performance wing of the Messerschmitt Bf 109G meant that most of the armament was positioned centrally. Twin machine guns in the fuselage were supplemented by a 20mm cannon mounted in the centre of the V12 engine. This fired through the centre of the propeller spinner.

As the war progressed, this firepower was becoming ineffective, so the Luftwaffe introduced

field modifications known as Rüstsätze. This was typically a kit capable of being retrofitted in the field by ground crew. Such kits were generally mounted under the wing and included payloads such as extra cannon for ground attack, machine-gun pods or drop tanks to increase the limited range. This gave the aircraft additional diversity to enable the fight to continue, in particular on the Russian Front and in Africa.

Top German fighter aces amassed hundreds of kills and sometimes had aircraft painted with their own colours



WEAPONS

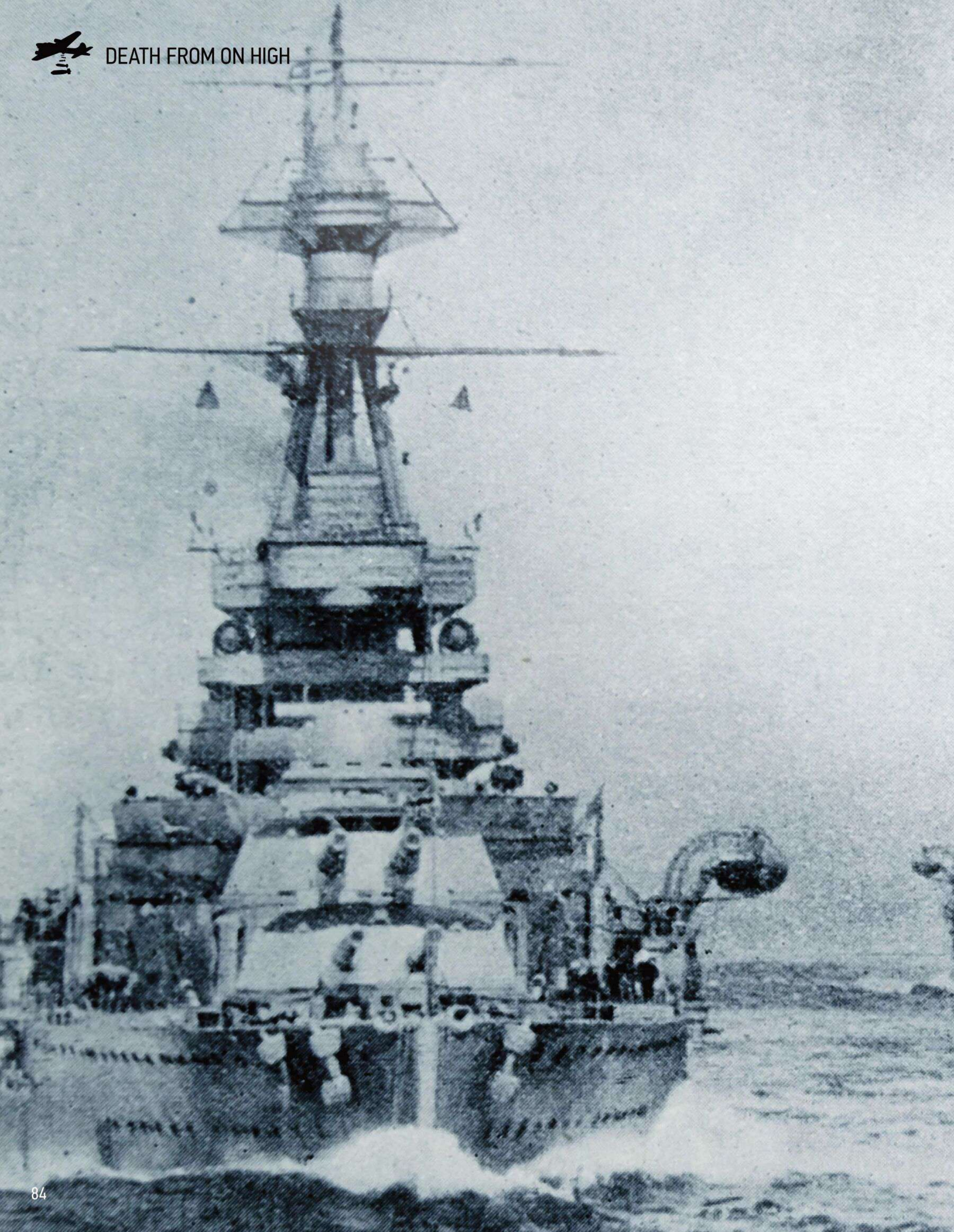
GUNS: 2 x 13MM (0.51IN) SYNCHRONISED MG 131 MACHINE GUNS WITH 300 ROUNDS PER GUN
 1 x 20MM (0.78IN) MG 151/20 CANNON WITH 200 ROUNDS PER GUN, OR
 1 x 30MM (1.18IN) MK 108 CANNON WITH 65 ROUNDS PER GUN (G-6/U4 VARIANT),
 2 x 20MM MG 151/20 UNDER-WING CANNON PODS WITH 135 ROUNDS PER GUN (OPTIONAL KIT: RÜSTSÄTZE VI)
ROCKETS: 2 x 21CM (8IN) WFR GR 21 ROCKETS (G-6 WITH BR21)
BOMBS: 1 x 250 KG (551LB) BOMB OR 4 x 50KG (110LB) BOMBS OR 1 x 300-LITRE DROP TANK

POST-WAR

Almost 34,000 Messerschmitt Bf 109s were built from 1935 until 1945, yet only about 100 survive today. Many are static, though some are still in flying condition. Most of those that survive were either captured by the Allies at the end of the war or recovered from combat areas in Russia and Eastern Europe, where they were abandoned and lost in large numbers at the end of the war.

A British soldier poses on top of a downed Bf 109 E during the Battle of Britain





THE LAST LINE OF DEFENCE

WORDS BEE GINGER

While the courage of Britain's fighter pilots secured victory in the skies, the ultimate threat of a German invasion was held at bay by the Royal Navy

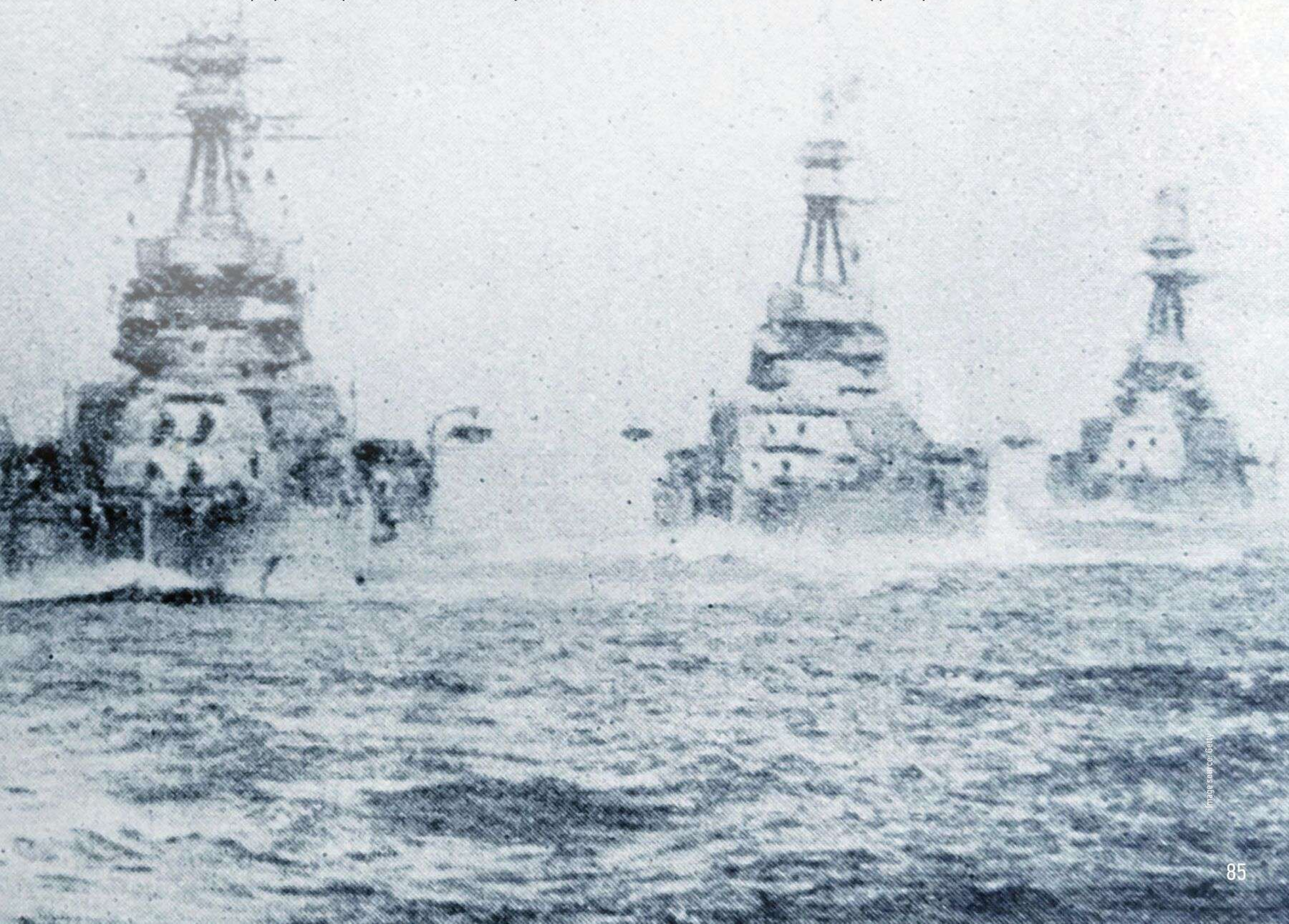
Following the fall of France in June 1940, the Royal Navy fought to maintain its command of the seas against German invasion. The Battle of Britain, which lasted from July to October of that year, marked the first defeat of Hitler's military forces. The Führer had hoped the British Government would seek a peace agreement with Germany, but this was not forthcoming, so Hitler was forced to prepare for Operation Seelöw

(Sealion), the code name for his plan to invade Britain. The aim of the operation was to eliminate the Royal Air Force, seal off the Royal Navy from its intended landing areas, destroy all units along the British coastline and prevent submarines from attacking the German landing fleet.

Since the mid-18th century the Royal Navy had been the world's most powerful fleet, playing a key role in the establishment of the British

Empire. It was also the largest, with more than 1,400 vessels to its name. It provided critical cover for Allied convoys during the early stages of World War II and was a major deterrent to a German invasion of Britain.

Much of the Royal Navy's fleet was engaged in the Mediterranean and Atlantic by the summer of 1940, a large proportion having been dispatched to support Operation Menace in Dakar, West Africa,





ROYAL NAVY BASES OF WWII

FROM THE SHETLANDS TO THE SOUTH COAST, THESE BASES WERE SOME OF THE MOST IMPORTANT INSTALLATIONS FOR THE ROYAL NAVY



Map: Getty

(a mission that saw the Allies fail in their attempts to capture the port). Even so, the Home Fleet guarding Britain's shores remained a formidable opponent, a far superior fighting force to its German counterpart, the Kriegsmarine.

Never matching the size nor power of the Royal Navy, the German fleet had suffered huge losses in April 1940 during the Norwegian campaign, with a number of destroyers and light cruisers sunk. These setbacks, combined with the lack of preparations for a full-scale amphibious assault on Britain, forced Hitler's naval commanders to adapt. Were the invasion to be greenlit, the Kriegsmarine would need to use river barges as landing craft. However, there were not enough of them, and they would be extremely vulnerable to attack. Yet, with U-boats unsafe in the shallow waters of the English Channel, and lacking in

“IF GERMANY HAD ATTEMPTED TO CROSS THE CHANNEL, THE AXIS SHIPS WOULD’VE FOUND THEIR PASSAGE BLOCKED BY FLOATING MONOLITHS”

the specified landing equipment that such a vast undertaking required, the Germans would have to persevere with their cumbersome barges.

Known as Kampines (and the slightly smaller version, the Peniche), they were to be transferred from the Rhine River to Calais to be converted. While 2,400 were assembled and modified with ramps, only 800 of the fleet were self-powered. This meant the remaining barges would have



Image source: Getty

Grand Admiral Erich Raeder, head of the Kriegsmarine during WWII until his resignation in January 1943

to be towed, but they could only travel at an excruciatingly slow three kilometres (two miles) per hour. Exposed by their lack of speed, the barges would need to be defended from potential British assaults, but many of the ships capable of holding off the enemy were now rusting at the bottom of the North Sea.

The Royal Navy suffered from no such dearth in ships, armed as it was with 700 patrol craft, 200 of which were already off the coast of France every night on picket duty, not to mention the destroyers it could call upon. If Germany had attempted to cross the Channel, the Axis ships would have found their passage to the landing sites (scheduled to include Dover, Portsmouth and Ramsgate) blocked by these floating monoliths.

Bristling with an array of guns, each of the Royal Navy's destroyers carried 40 depth charges, which were filled with between 600 and 800 pounds of Amatol, a highly explosive mix of TNT and ammonium nitrate, as well as a complement of torpedoes. A slow-moving barge packed with soldiers and horses would have proved easy pickings. But, imposing as these ships were, they were not indestructible.

Seven British destroyers had been lost during the campaign in Norway, while six had been lost and 19 damaged during the miraculous Allied escape at Dunkirk. As a result, some of the Royal Navy's most valuable assets had been temporarily withdrawn from service. By the end of 1940, 30 Royal Navy destroyers would be lost.

In the event of a German crossing, the Royal Navy would have been able to summon an almighty fleet to meet it. Alongside destroyers it

The German heavy cruiser *Blücher* sinks in the Oslofjord after being hit by the naval guns of the nearby Oscarsborg Fortress



also readily deployed cruisers, sloops, corvettes and of course submarines. With the alert put out across the airwaves, Britain's submarines would have slipped into the depths of the Channel to strike from below as the surface fleet fanned out above. Even if the Luftwaffe had managed to secure aerial supremacy over Britain, its naval counterpart would have faced a virtually impossible task in attempting to do the same at sea. In the end it was never asked to try. Operation Sealion never left port.

In 1944, Grand Admiral Raeder, the head of the Kriegsmarine, revealed the main reasons for the invasion's failure to launch in a document catchily titled *Brief Statement of Reasons for Cancellation of Invasion of England*, prepared by naval staff.

"Owing to the weakness of our naval forces, there could be no effective guarantee against the enemy breaking into our area of transports despite our mine barrages on the flanks and despite our air superiority."

In addition to this, the German High Command had also been previously warned that "the weather in the North Sea and Channel during the second half of September is very bad..."

Both Raeder and Göring (Commander-in-Chief of the Luftwaffe), neither of whom had ever fostered any real enthusiasm for the plan, were mightily relieved when it was finally shelved by Hitler on 17 September 1940. He did so in the wake of the Luftwaffe's failure to destroy the RAF in the skies, but the menace of the Royal Navy also weighed heavily on his mind as he postponed indefinitely any dreams of landing Wehrmacht troops on English sand.

Some historians believe the Battle of Britain to have been a naval victory due to Germany's inability to confront and defeat the Royal Navy. While the undoubted heroism of the pilots who

scrambled to defend Britain in brutal dogfights has been hailed ever since, the argument that it was ultimately the presence of the navy that deterred Hitler from putting Sealion to the test is a convincing one. After all, the Luftwaffe had enjoyed complete aerial dominance at Dunkirk and yet failed to inflict any significant damage on the Allied ships at their mercy. What hope would they have had against a fleet of hundreds armed to the teeth directed by men fighting in defence of their homeland?

One theory as to why the Royal Air Force took the lion's share of the glory is that its image could be used to easily manipulate the opinion of the then-neutral Americans. In the hands of an orator as skilled as Winston Churchill, the concept of a small band of courageous pilots

holding back the seemingly relentless Nazi tide was a powerful image indeed. "Never in the field of human conflict was so much owed by so many to so few" is a line from his August 1940 speech that has since passed into immortality.

Yet when it comes to the Battle of Britain, the real, harsh reality of an event that has defined British history ever since, it seems fitting to allow the final word to RAF flying ace Wing Commander Hubert Raymond Allen.

"It was sea power that ruled the day in 1940, and fortunately Britain had a sufficiency. The air situation was, of course, important, but by no means fundamental. Without doubt the 500 or so section, flight and squadron leaders of Fighter Command earned their laurels. But the real victor was the Royal Navy, the Silent Service."



Flanked by two naval officers, Adolf Hitler stands on board a Kriegsmarine warship



DEATH FROM ON HIGH



SPITFIRE SM520

WORDS JACK GRIFFITHS

The two-seater version of a TR9, this Spitfire helped train future pilots for the perils of airborne warfare



The Spitfire is almost ubiquitous when discussing Britain's war in the skies during War World II. There were 22 different versions of the classic interceptor fighter built during the height of its time in the RAF. One of these was the SM520, a two-seater based on the TR9 model, which itself came from a Spitfire Mk IX.

The conversion from one to two seats was a post-war programme, with the first SM520 arriving in 1948. The project helped provide flight and gunnery practice for new recruits to the RAF, such as the Irish Air Corps (IAC) Seafire fleet and many other air forces in what was to become the Commonwealth of Nations.

This particular model was constructed as a one-seater TR9 in a West Bromwich factory and was

first delivered to the RAF in November 1944. As the war came to an end, the fighter was part of the mass RAF disarmament measures and sold to the South African Air Force (SAAF) for £2,000.

In Africa, it helped train pilots who were to be sent to the conflict in Korea and prepared them for flying in the American-made SAAF P-51 Mustangs. After a series of changes in ownership, the single-seat SM520 was converted to a two-seater in 2002, renamed G-ILDA (after a previous owner's granddaughter) and passed on to the Boulton Flight Academy, where it is currently located.

The original British paint scheme was revived and it is now in a camouflage grey/green scheme as seen on the European Standard Day Fighters that helped Britain defend its borders in its hour of need.



SPITFIRE SM520

YEARS BUILT	1948-51
LENGTH	9.58M (31FT 5IN)
WINGSPAN	11.23M (36FT 10IN)
MAXIMUM SPEED	644KM/H (400MPH)
RANGE	724KM (450MI)
ENGINE	ROLLS-ROYCE / PACKARD MERLIN 266
CREW	2 (STUDENT AND INSTRUCTOR)
ARMAMENT	2 X .303 BROWNING MACHINE GUNS

"AS THE WAR CAME TO AN END, THE FIGHTER WAS PART OF THE MASS RAF DISARMAMENT MEASURES AND SOLD TO THE SOUTH AFRICAN AIR FORCE (SAAF) FOR £2,000"

This MK Ila P7350 is the only Spitfire that fought in the Battle of Britain and is still airworthy

The enduring Spitfire design means it is the only Allied fighter built during the war that was used until the 1950s. More than 20,000 were built in total

SM520 owned by the Boulton Flight Academy



Pilots of the 611 West Lancashire Squadron launching a Spitfire off Biggin Hill Airport in 1942



COCKPIT

The aircraft that embodies the spirit and resolve of the British in the summer of 1940 is remarkably easy to pilot. Simple to start, the Merlin engine nearly always fired after two blades and was very reliable, with each and every cockpit virtually identical and compact. Pilots past and present have commented favourably on its ease of handling as well as the iconic sound of its engine. As with many aircraft of the era, the Spitfire became harder to control when it neared its top speed. However, its light control column allowed it to be more manoeuvrable than its rival, the Messerschmitt Bf 109, a key advantage during the Battle of Britain. It would often turn out of dives much quicker than its German equivalent. Without powered controls, these turns were achieved by the strength of the pilot's muscles alone.



The cockpit of the SM520 is authentic, down to the spade-like control column and the throttle control on the sidewall



Unlike the Messerschmitt, the Spitfire never took to the use of cannon and relied on its dual machine guns

BROWNING ARMAMENT

During the summer of 1940, the RAF had a foolproof plan against the oncoming Luftwaffe. The Hurricanes would go after the German Junker

87 and 88 bombers while the Spitfires would face off against the fighters. This decision was tailor made for the RAF aircraft, as the guns on the Spitfire were positioned narrower than those on the Hurricane, making it easier to engage the Messerschmitt fighters.

At its full capacity, the Spitfire could have eight Browning machine guns each containing 300 bullets. This sheer amount of ammo at a pilot's disposal meant even those with poor aim could at least hit something. These projectiles ranged from standard to tracer and incendiary to armour-piercing. The incendiary rounds in particular were very effective, as the RAF pilots targeted the fuel tanks of the Luftwaffe and blew Messerschmitts out of the sky.



When not in use, the opening of the machine gun's barrel was taped over to prevent the mechanism from freezing at high altitudes



MESSERSCHMITT BF 109G

INSIDE THE SCOURGE OF THE SPITFIRE AND THE LUFTWAFFE'S BACKBONE

Fresh from its preparation in the Condor Legion in the Spanish Civil War, the Luftwaffe's Messerschmitts were ready to take the battle to the British over the Channel. 33,000 were made in total during the war and they provided the spine of the Luftwaffe fleet. Unlike the Spitfire, the Messerschmitt only had two machine guns but these contained magazines of 1,000 rounds each.

They also had two 20mm cannons, which were useful against bombers but struggled to cope with the manoeuvrability of Spitfires and Hurricanes. Its main Achilles' heel was its short range, which prevented it from doing more damage across the Channel. Despite its loss in the Battle of Britain, the Bf 109 shot down the most Allied planes in the war and the design was taken on in 1947 by the new state of Israel. Its longevity was down to its simple and direct design, and it was still frequently used even in the later years of the war when the jet-powered Me 262 came into production.

Serving across all fronts and in all theatres, the Bf 109 was integral to the Nazi war machine





EMBLEMS AND DESIGN

With its origins in World War I, the RAF roundel was used to identify British planes from the ground and in the heat of a dogfight. The Union flag was initially put forward, but due to its likeness to the German cross the roundel was incorporated instead.

The first Spitfires were painted brown and dark green while the underside fuselage was white to allow for easy identification by anti-aircraft guns and thereby reduce friendly fire. As the fight against the Luftwaffe began to spread to the Channel, the paint scheme changed from

brown to grey as the new colour blended in with the dark sea.

This colour scheme was employed from then on with the odd variation. These included pink or dark blue for reconnaissance missions at low and high levels respectively and light brown for Middle East missions. Even the roundel was dropped, as in operations over Japan it was deemed too similar to the red disc Hinomaru emblem of the Japanese Zeros.

On the SM520, part of the engine has been moved to make way for the second cockpit in a modern redesign



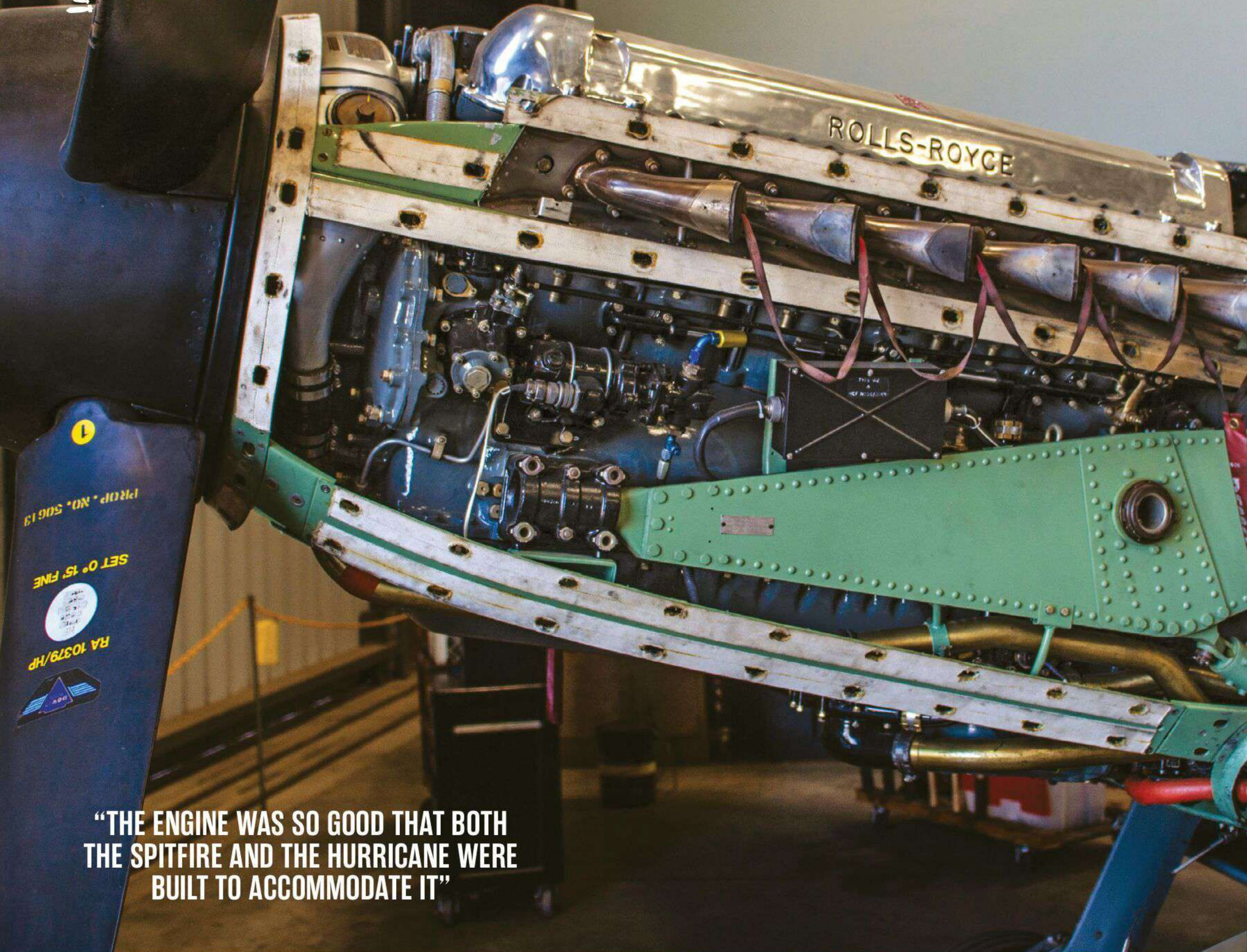
After the Battle of Britain, the Spitfire took on more of a reconnaissance role and was even occasionally painted pink to add to its camouflage

**“PILOTS PAST AND PRESENT HAVE COMMENTED
FAVOURABLY ON ITS EASE OF HANDLING AS WELL
AS THE ICONIC SOUND OF ITS ENGINE”**





DEATH FROM ON HIGH



**"THE ENGINE WAS SO GOOD THAT BOTH
THE SPITFIRE AND THE HURRICANE WERE
BUILT TO ACCOMMODATE IT"**

SPITFIRE VS HURRICANE

WHICH BATTLE OF BRITAIN
MACHINE WAS THE SUPERIOR
FIGHTER CRAFT?



The engine was a good all-rounder and was also used in Lancaster bombers, Hurricanes and the USAAF P51 Mustang

THE MERLIN ENGINE

THE POWERHOUSE BEHIND THE SPITFIRE'S ICONIC SOUND

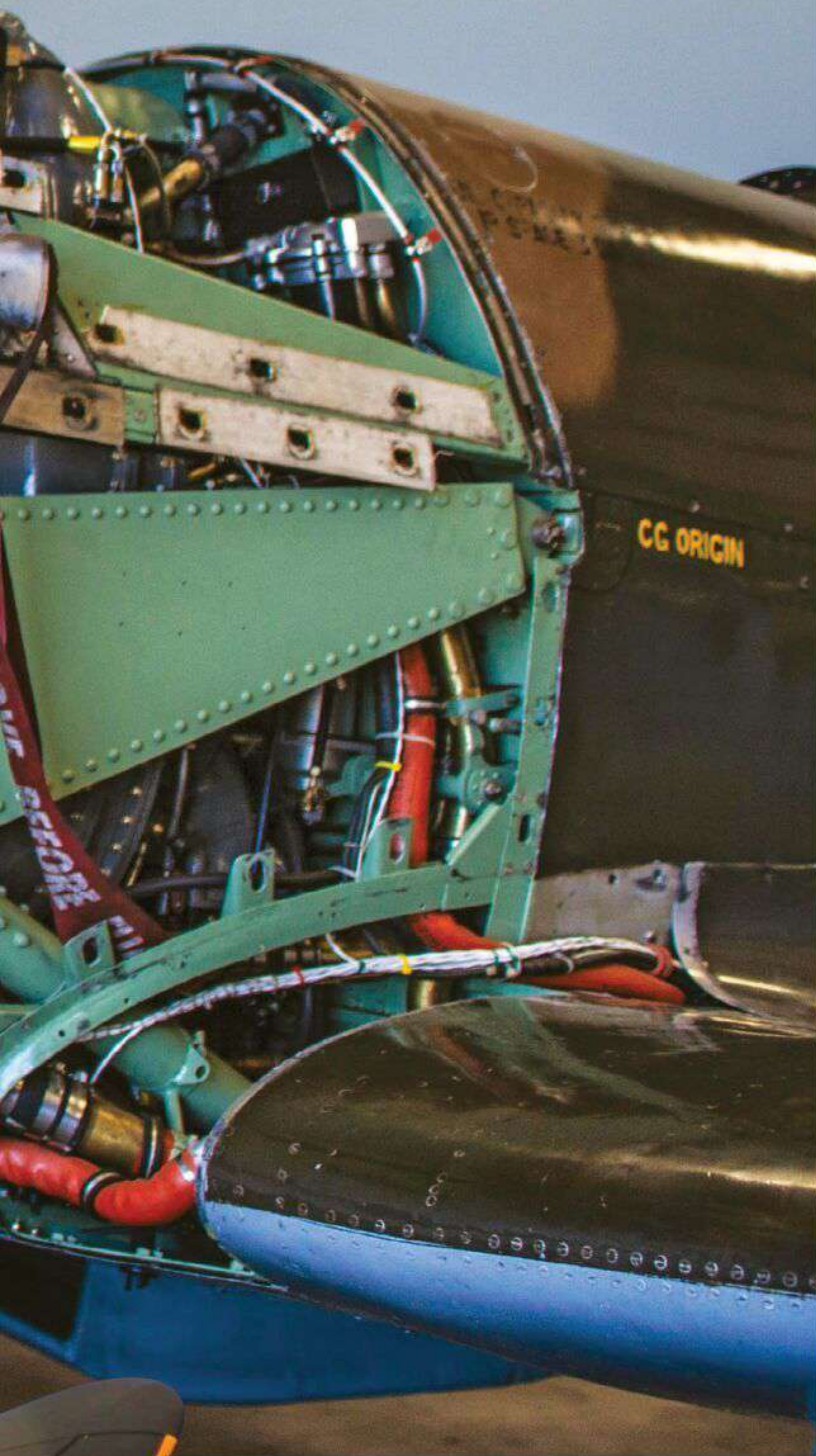
Despite being used in more than 40 aircraft during World War II, the Merlin is most commonly associated with the Spitfire. Named after the bird of prey (a small species of falcon), the engine first took to the skies in February 1935 and was a marked improvement on the previous Rolls-Royce instalment, the Kestrel.

The engine was so good that both the Spitfire and the Hurricane were built to accommodate it. However, as efficient as it was, the Merlin wasn't without its faults. Unlike the engines of German

Messerschmitts, the Merlin wasn't fuel-injected, so there was a danger of it suddenly cutting out during steep dives, a potentially fatal flaw.

However, this was mostly fixed in 1941 by the addition of a new diaphragm in the engine's float chamber. This was affectionately known as the 'Miss Shilling's Orifice' after its designer Tilly Shilling. Even after World War II the Merlin was still in assembly and production only ceased in 1950 after 150,000 had been made to help Britain win the war.

“THE MERLIN ENGINE WASN'T FUEL-INJECTED, SO THERE WAS THE DANGER OF IT SUDDENLY CUTTING OUT DURING STEEP DIVES, A POTENTIALLY FATAL FLAW”



The Spitfire was very nearly called the 'Shrew', which wouldn't have been quite as intimidating

SUPERMARINE SPITFIRE

- ★ MAXIMUM SPEED 608KM/H (378MPH)
- RATE OF CLIMB PER MIN 812M (2,665FT)
- CEILING 10,668M (35,000FT)
- ★ ARMAMENT 2 X 20MM HISPANO MK II CANNONS
- 4 X .303 CAL BROWNING MACHINE GUNS
- 2 X 240LB BOMBS
- ★ LONGEVITY 1938-48 (20,351 MADE)



HAWKER HURRICANE

- MAXIMUM SPEED 547KM/H (340MPH)
- RATE OF CLIMB PER MIN 847M (2,780FT) ★
- CEILING 10,972M (36,000FT) ★
- ARMAMENT 4 X 20MM HISPANO MK II CANNONS
- 2 X 250LB BOMBS OR
- 1 X 500LB BOMB
- LONGEVITY 1937-44 (14,583 MADE)





DEATH FROM ON HIGH

VICTORY IN SEPTEMBER

WORDS HARETH AL BUSTANI

After months of attrition over Britain, the RAF and Luftwaffe
gambled everything on one great showdown



By the time September rolled around, as the brutal and bloody British summer neared its end, Fighter Command and the Luftwaffe were both starting to sweat. On the final day of August alone the British lost 40 planes and nine pilots, with 18 more badly wounded. The battle of attrition over the skies of Britain was taking a heavy toll, and the attacks kept rolling in, one after another – killing scores of pilots, destroying planes and dealing blow after blow to the island's key sector stations. As September broke, things were so bad that Air Chief Marshal Hugh Dowding could no longer rotate his 11 Group squadrons, so they could rest. Yet, despite the Luftwaffe's best efforts to cripple the RAF in quick fashion, that coveted critical blow continued to elude them. After absorbing yet another day of attacks, 11 Group Commander Keith Park personally convinced Winston Churchill that Britain could endure – his careful strategy of deploying small squadrons and targeting bombers had proved a wise one.

In the process, the Luftwaffe themselves had suffered grave losses, dwindling down from 900 fighters to 735 while, somehow, the RAF grew. And even after laying waste to Britain's sector stations, there was always a chance that the British might retreat to airfields beyond London – out of range of German planes. Though the Germans enjoyed superior numbers and experience, the campaign

was draining away their most experienced pilots, and the British were narrowing the gap. Despite Germany's superior access to labour and material, between June and September Britain produced 1,900 fighters, compared to Germany's 775. Crucially, Fighter Command was taking out more German planes than it lost. Even Göring was beginning to groan, "Is this my Luftwaffe?"

Hitler, too, was growing impatient. Having never truly committed to Operation Sealion, he was especially incensed at having to delay the invasion to 21 September because the Luftwaffe had failed to dominate Britain's skies. Running out of time, Göring and Kesselring were desperate to draw the RAF into larger battles, where they might be able to deal a more crushing blow. For most of the Battle of Britain, although strategic bombing had proved incredibly costly to both sides, both Germany and Britain had avoided major cities. However, by the end of August more than 1,000 British civilians, including 136 children, had been killed. So, when a group of German bombers accidentally hit a residential quarter in London's East End, Britain responded by striking a German residential neighbourhood – killing eight and wounding 21.

Denouncing Churchill's "night attacks", Hitler roared, "If the British Air Force drops two, three or four thousand kilos of bombs, then we will now drop 150,000, 180,000, 230,000, 300,000 or 400,000

kilos, or more, in one night." The stakes were particularly high for Göring, who had bragged that Berlin would never be bombed. Now he had the green light, he and Kesselring hoped that by bombing London they would not only draw the RAF into a larger engagement but clog up Britain's roads with fleeing vehicles.

On 7 September the gloves came off. Göring announced on the radio that he was personally taking charge of Operation Loge, named after the Norse god of fire. At just shy of 4pm British radars began flickering as a seemingly endless array of German planes throttled over the Channel. As plotters desperately pored over maps a horrifying image emerged – a Luftwaffe raid of unprecedented proportions, with a colossal 348 bombers and 617 fighters stretched three kilometres high. Expecting the Germans to split up and attack their southeastern airfields, within half an hour Fighter Command scrambled its squadrons. Aghast, they realised that the entire German fleet was headed straight for London. By the time Park gave the order to attack, the Thames' factories and docks were already erupting in flames.

As air-raid sirens blazed over the capital the gravity of the situation sank in, with residents frantically scurrying to bomb shelters. Park sent out his squadrons in pairs, telling his Spitfires to focus on picking off fighters, while the Hurricanes

Impatient, the Luftwaffe shifted its attention to Britain's capital, with disastrous results

"AS THE SUN EMERGED OVER A CLOUDLESS SKY ON 15 SEPTEMBER, GÖRING WAS RUNNING OUT OF TIME. THIS WAS HIS LAST CHANCE TO BREAK THE BACK OF BRITAIN'S AIR FORCE AND MAKE WAY FOR AN INVASION"

While the Spitfires engaged enemy fighters, Park told his Hurricanes to take down the bombers

tore into the bombers. However, eager to show off his 'Big Wing' strategy, Squadron Leader Douglas Bader sent up a large fleet, which ended up overcrowding the skies, further adding to the confusion. By the time the British planes arrived the damage had already been done and the Germans were heading home. Though the Britons managed to take down 38 German bombers and fighters, they lost 28 of their own alongside a staggering 448 civilian lives in the capital.

It was a devastating defeat, one that was followed by a welcome reprieve, when a bout of bad weather forced the Germans to stagger their assaults. The Luftwaffe pressed on with night-time raids, which the British were powerless to stop, lacking sufficient night fighters. However, the Luftwaffe's shift of focus away from airfields to London gave Fighter Command some much-needed breathing room. After months with their backs to the ropes, this was a sudden, crucial opportunity to regroup, and Dowding began rotating his squadrons again. As the Nazi war machine hammered down on their beloved capital, the people of Britain grew more defiant than ever.

On 9 September, a break in the weather allowed the Germans to return, but this time Fighter

Command was ready. When the two Luftwaffe squadrons attempted to form a pincer movement, they were promptly intercepted – one forced to bomb Canterbury instead and the other pressured into dropping its payload over the countryside. While the RAF lost 17 planes and six pilots they took down 24 German aircraft and ten pilots.

With autumn creeping in the window for a serious air victory was closing. As the weather turned once again, Air Vice-Marshal Trafford Leigh-Mallory and Bader refined the latter's

Big Wing strategy – enlarging the wing to five squadrons rather than three. Park, meanwhile, studied combat reports, concluding that his pilots should attack head-on as cohesive squadrons. He reminded them not to hunt down and kill fallen pilots but to damage as many planes as possible.

As the Sun emerged over a cloudless sky on 15 September, Göring was running out of time. This was his last chance to break the back of Britain's air force and make way for an invasion. Just after 11am, radars picked up German planes preparing to attack. Park co-ordinated his response under the watch of Winston Churchill himself. As the Women's Auxiliary Air Force began plotting out hundreds of bombers, Park remarked, "This, Mr Prime Minister, looks like the big one," and began scrambling his squadrons to meet the armada.

Brandishing the full force of Luftflotte 2 – 500 bombers alongside 500 Me 109s and 120 Me 110s – Kesselring split his forces, and this was just the preliminary raid. However, with only 25 Dorniers, protected by more than 100 Me 109s, and 21 specially adapted Me 109s carrying 550-pound bombs, the attackers found themselves outnumbered for the first time. As they hit Britain's coast the German fighters were picked off by buzzing Spitfires and Hurricanes.

As German bombs fell over Britain's capital terror rapidly turned to patriotic resolve



The panicked Dorniers huddled together to protect one another, making a suicidal press towards London only to see Bader's fabled Big Wing swoop in from the horizon. Ignoring the modified Me 109s, the Big Wing set upon the Dorniers like ravenous eagles, tearing seven out of the sky, with one hurtling straight into Victoria Station. As the 254 British fighters descended to refuel suddenly the radars went haywire, picking up more enemies than ever before. The storm had come – 114 bombers, joined by a colossal 340 Me 109s and 20 Me 110s.

Knowing this was a critical juncture, both sides made the ultimate gamble – with the Germans' sights set on the Royal Victoria and West India Docks. Predicting that only London could be the target of such an assault, Park pulled most of his squadrons back, launching a series of smaller assaults before finally throwing the full weight of the RAF at the invaders. One after another, 185 British fighters attacked in waves, tearing into the German bombers, while Bader's Big Wing clamped down on the German fighters. Broken, the Germans ran out of fuel, dropping their bombs wherever they could before turning back home, with the RAF in hot pursuit. Flak detonated all around them, swatting planes out of the skies in balls of flames. Livid, Göring ordered a second massed attack. When Churchill asked how many reserves were left, Dowding replied, "I have no reserves, sir, every aeroplane is in the sky". Fortunately for Britain, the second wave never came.

Though the RAF lost 29 aircraft and 12 pilots, they destroyed 56 Luftwaffe planes and killed or captured 136 pilots. Rather than the crushing defeat it had meant to be, it was a nail in the coffin of Operation Sealion and a serious blow to Nazi morale after months of assurances the British were teetering on collapse. Shifting its attention away from Fighter Command's infrastructure to London would prove one of Germany's most fatal mistakes. However, as the bombs poured over Britain's cities for 57 consecutive days, a deadly new phase had begun – the Blitz.



After months of being told the RAF was on its last legs, the failure to take Britain's skies dealt a crushing blow to Nazi morale

Image source: Getty Images



Göring hoped that bombing London would draw the RAF into a decisive engagement

Image source: Alamy



AIR VICE-MARSHAL KEITH PARK

THE MASTERMIND BEHIND BRITAIN'S MAGNIFICENT DEFENCE WAS ONE OF WORLD WAR II'S UNSUNG HEROES

Keith Park was born in New Zealand in 1892 to Scottish parents and served as a volunteer in World War I. Having survived Gallipoli, he was promoted to Second Lieutenant before being badly wounded by a shell at the Somme. Declared unfit for duty, he joined the Royal Flying Corps and after shooting down 20 Germans, and being shot down twice, was awarded the Distinguished Flying Cross and Military Cross and bar, as well as the French Croix de Guerre.

Promoted to squadron commander, he continued to serve the RAF, and in 1938 was made Dowding's Chief of Staff before being promoted to Controller of the crucial 11 Group two years later ahead of Leigh-Mallory. A charismatic leader, he flew his own Hurricane to various airfields, explaining his tactics to pilots personally and lifting spirits at a crucial time.

Having orchestrated the remarkable response to the Battle of Britain, in 1941 he was sent to Egypt and later conducted the defence of Malta – a vital holding point between Europe and North Africa. Under his watch, Malta endured Luftwaffe bombing raids every single day for six months, turning the island into what Churchill called the "unsinkable aircraft carrier". After leading the air force's attack on British Malaya, he retired at the end of the war, eventually dying at the age of 82 in his native New Zealand.

"UNDER HIS WATCH, MALTA ENDURED LUFTWAFFE BOMBING RAIDS EVERY SINGLE DAY FOR SIX MONTHS"



Keith Park was a rare breed: daredevil, master strategist and inspiring leader

Image source: Alamy





LEGACY OF THE BATTLE

Unable to destroy the RAF, in September 1940 the Luftwaffe shifted its focus to Britain's cities, bombing civilians without compunction. So who were the heroes who saved Britain, and what was the cost of defeat for Germany?



LEGACY OF THE BATTLE

THE BLITZ

BRITAIN UNDER SIEGE

WORDS STEVE WRIGHT

**The story of the nine-month bombing campaign
that ravaged parts of Britain**

While no nation is ever truly free from the threat of invasion or the ravages of war, Britain has had more advantages than most when it comes to defence. As an island, its ready-made moat in the form of the English Channel and North Sea has provided an obstacle for would-be occupiers over the centuries. As technology advanced, however, the moat became moot. While it prevented Britain from sharing the same fate that Hitler's blitzkrieg had inflicted on the rest of Europe, it was no defence against the Luftwaffe.

Initially, Hitler's targets were purely military. Between 10 July and 31 October 1940, the Battle of Britain was fought as the Luftwaffe faced off against the RAF, in the process attacking factories, airfields, boat convoys and ports in an

attempt to either establish air supremacy ahead of a forthcoming invasion or compel the British into accepting a peace settlement.

In the event, neither happened. While losses on both sides were heavy, the Luftwaffe failed in both of its aims. While Operation Sealion (Hitler's plan to invade Britain) was indefinitely shelved, the country's ordeal was only just beginning. The Battle of Britain had involved military targets; now, the whole civilian population was at risk. As the poet Robert Graves put it, a soldier "cannot feel that his rendezvous with death is more certain than that of his Aunt Fanny, the firewatcher".

The first air-raid sirens in London actually sounded on 3 September 1939, the day Prime Minister Neville Chamberlain announced that Britain was at war with Germany, but they were false alarms. It wasn't until just over a year later, on 7 September 1940, that the capital was first explicitly targeted in a calculating manner. The sirens would sound again many more times.

A formation of 617 Messerschmitt fighters and 348 bombers set off from northern France and were first spotted over the English coast at around 4.14pm. But rather than branch off towards the various targets, as was the norm, they carried on to their target in London's Thames Estuary. The first bombs – hundreds of small incendiary devices – landed on the Ford motor works in Dagenham and the Beckton gasworks, situated above the three Royal Docks at Woolwich Reach. The resulting fires spread from North Woolwich to Tower Bridge, which, as well as the obvious civilian and building destruction, dispatched many vital war supplies. The RAF was caught unawares,

Fireboats attempt
to put out a blaze



Image source: Getty

The Blitz permanently
changed the landscape
of much of the country



THE BLITZ: BRITAIN UNDER SIEGE

**"THE BATTLE OF BRITAIN HAD INVOLVED
MILITARY TARGETS; NOW, THE WHOLE
CIVILIAN POPULATION WAS AT RISK"**





A Luftwaffe pilot's view of London during a bombing raid

Image source: Alamy

Few were truly safe. More than 2 million residences had access to small, self-constructed 'Anderson' shelters, and some were given grants to reinforce rooms in their own homes to act as shelters, but many in poor and vulnerable areas didn't share this relative luxury. A lot of people used public shelters, but this wasn't always enough to save them. One such example of this can be seen in a bombing raid on 13 October 1940, during which a bomb penetrated all the way through a block of flats towards the basement of a public shelter in Stoke Newington, where some of the street's residents were hiding. The shelter collapsed and many of its inhabitants suffocated or were drowned by sewage coming in from broken pipes. More than 160 people died.

Despite their use initially being discouraged (and in some cases restricted) by the government, many London Underground tube stations became popular as shelters for large sections of the city's population. While conditions were cramped and unavoidably uncomfortable, they were eventually made relatively homely, with bunks and food stalls set up. However, tragedies still took place. On 12 October, seven people died during an explosion at Trafalgar Square station and a further 19 the following night at Bounds Green station. The next evening, more than 60 people perished due to the after-effects of a heavy bomb attack at Balham High Road, and on 11 January 1941 an explosion at Bank killed 111 people. Church crypts were often used as shelters, and, in coastal locations such as Ramsgate, caves were too.

and firefighters called to the scene faced their first showcase of what was to come.

This was only the beginning of the day's carnage. The bombers continued to come back around, causing even more damage. In what later became known as 'Black Saturday', approximately 300 bombers flew over London at 6.10pm, using the earlier fires as guiding beacons. Their attack lasted until 4.30am the next morning. The first day of bombing left around 450 civilians dead and 1,600 injured, not to mention the destruction of numerous supplies and shipping.

This would prove to be the first of 57 consecutive nights of bombing in the capital. Winston Churchill, Chamberlain's successor as Prime Minister, referred to the attacks as "indiscriminate bombings", saying Hitler hoped that "...by killing large numbers of civilians, and women and children, that he will terrorise and cull the people of this mighty imperial city". While this may well be true, it was in all likelihood a secondary aim. According to Juliet Gardiner in *The Blitz: The British Under Attack*, "...in fact its intention was to devastate the London docks so that the food and materiel essential to the prosecution of the war could not be imported, and to destroy government offices in central London from where the war was being directed".

By this point, London had become "a city pock-marked with ruins and rubble, its streets assaulted, private spaces ripped open to public gaze... the weary, soot-blackened faces of the firemen, the ARP wardens, the heavy rescue squads, the numbing sense of exhaustion". The results of the night's bombing were immediately apparent both by the obvious physical destruction and the smell of burning that clung in the air.

"'BLACK SATURDAY' WAS THE FIRST OF 57 CONSECUTIVE NIGHTS OF BOMBING IN THE CAPITAL"

Damage to the London Necropolis Railway Station after London's biggest night-time air raid

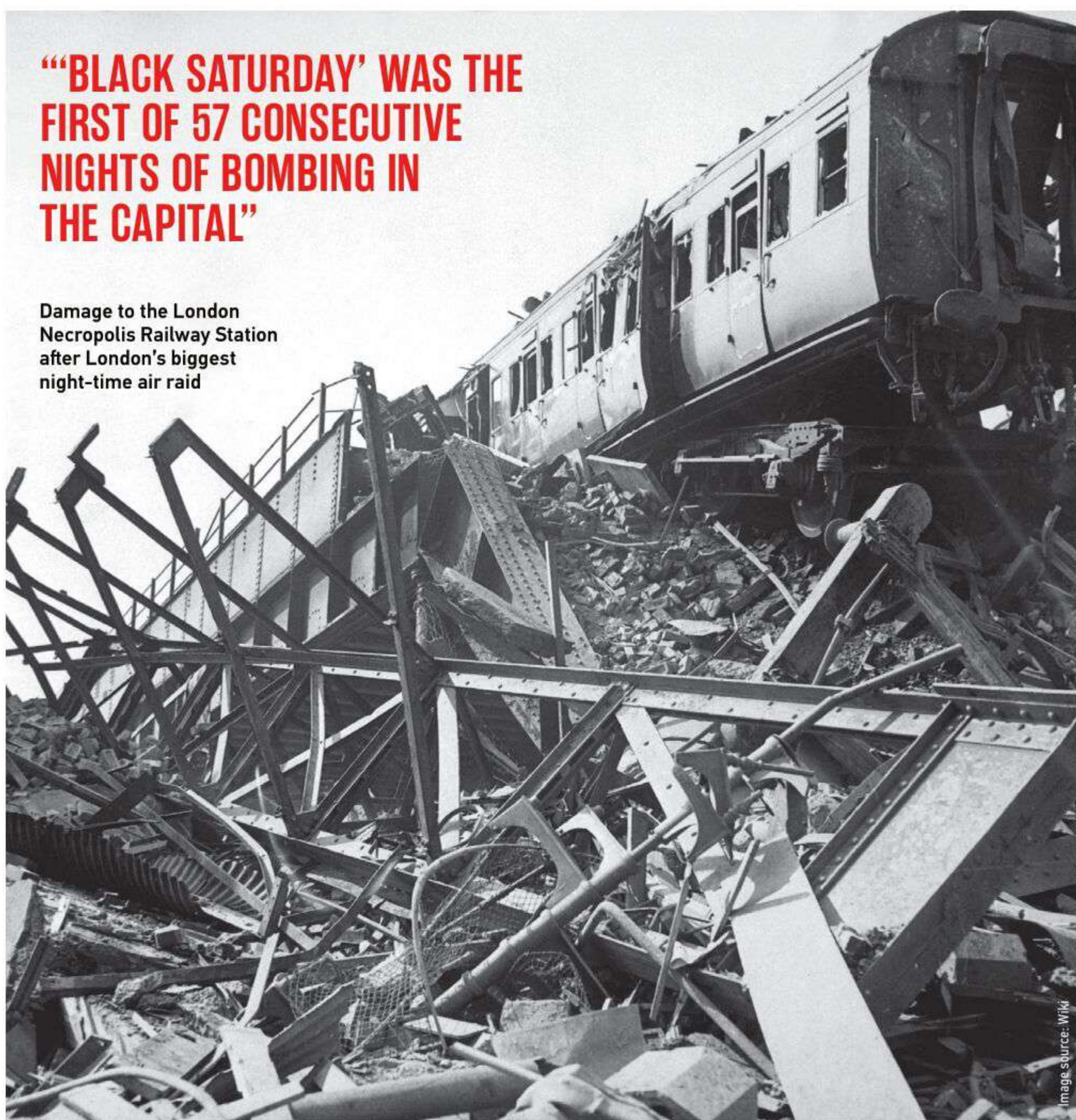


Image source: Wiki

London was the most frequently bombed city (it was raided 71 times, with 18,291 tons of bombs), followed by Exeter and Liverpool, but many other places also suffered grievously.

Birmingham was heavily raided in November 1940 after a shift in strategy that saw industrial cities increasingly targeted, with more than 800 people killed that month (including 53 in one night on 19 November during the bombing of the BSA factory), followed by a 13-hour raid on 11 December, during which 263 people lost their lives.

Fellow Midlands city Coventry was also on the receiving end of the Luftwaffe's wrath, attacked during a 12-hour spell on 14 November in retaliation for an earlier British raid on Berlin. Due to the sheer number of incendiary devices dropped, it was reported that "a halo of red flames" could be seen from Warwick and Birmingham, with the damage caused being such that *Daily Express* journalist Hilde Marchant referred to it as "the night they Guernicaed Coventry". Almost a third of the houses in the city were rendered uninhabitable and a third of its shops destroyed. Many of the 568 dead had to be buried in mass funerals, and 1,256 people were left injured.

Liverpool was referred to as Hitler's number one target outside the capital due to its arrangement of power stations, gas stations, docks and food storage. One particularly destructive sequence took place between 28-29 November, during which more than 350 tons of high-explosive bombs, 30 land mines and 3,000 incendiary devices were dropped. Nearly 300 people died, including 166 who perished when the building above their air raid shelter was hit by a parachute mine. Subsequent attacks from 20-23 December took out swathes of dockside, shipping and residential areas, with hundreds losing their lives over these nights. The Merseyside town of Bootle stands as an example of concentrated destruction: 8,000 of its 17,000 homes were destroyed or damaged in some way.

Liverpool wasn't the only northern city to be hit – Hull and Manchester were among those that also suffered greatly, with almost 600 tons of bombs dropped on each.

Coastal locations didn't escape the attacks either. Southampton saw 77 killed in one night on 23 November – a date that also saw much of the city centre destroyed. A further 137 perished on the night of 30 November-1 December, 96 of whom died when their shelters were hit.

Nearby Portsmouth was deluged with more than 40,000 incendiaries on 10-11 January 1941, causing more than 2,000 fires and 171 deaths, and Bristol suffered from repeated assaults. One attack on 24 November killed 207 and laid waste to much of the city's historic architecture, and another, 12-hour raid on 3 January wrecked much of what was left, killing 149 people in the process.

Later on during the Blitz, Scotland would also come to suffer. Having previously escaped relatively unscathed, Glasgow and Clydebank were both targeted on 13 March as part of another shift in strategy geared towards targeting port towns. The latter saw 35,000 of its 50,000 population homeless by the second night of its blitz, such was the extent of the damage, and only eight of its 12,000 homes were reported to be undamaged. Elsewhere in the home nations, Swansea and Cardiff were both extensively bombed, and Belfast suffered its first raid on 7-8 April, closely followed



SECOND GREAT FIRE OF LONDON

THE STORY OF ONE OF THE WAR'S MOST CATASTROPHIC NIGHTS OF BOMBING

The days of 24-26 December marked a reprieve of sorts for the nation's bombed-out cities. German attacks ceased, and the people were able to temporarily forget their troubles to enjoy Christmas, or 'Blitzmas' as it came to be known. Many people still spent Christmas Eve in bomb shelters, though, just in case.

The respite was short lived. On 29 December, the Luftwaffe planes returned, bringing 120 tons of explosives and 22,000 incendiary devices, with which they carpeted the city. Around 100,000 bombs fell in just a few hours.

Fires spread throughout the city, the largest being half a square mile between Moorgate,

Aldersgate, Cannon Street and Old Street. The area affected was even bigger than the 1666 Great Fire of London, recorded by Samuel Pepys. Indeed, Virginia Woolf wrote, "On Sunday night, as I was reading about the great fire, in a very accurate and detailed book, London was burning. 8 of my city churches destroyed, & the Guildhall."

Having been damaged during the original Great Fire and gradually restored and updated in the intervening years, the Guildhall was one of the victims of the bombings, with many of its treasures lost. St Paul's Cathedral was also heavily damaged when it was struck by 28 bombs. Churchill insisted that St Paul's be saved, and the cathedral became a symbol of London's defiance and determination to carry on.

Attempts at combating the fires were hindered by damage to the water mains and the Thames being at low tide, with fire brigade boats unable to get close enough or draw sufficient water. In all, around 160 people died during this night of bombings, 14 of whom were firefighters.

"THE LUFTWAFFE PLANES RETURNED AND AROUND 100,000 BOMBS FELL IN JUST A FEW HOURS"



St Paul's Cathedral was severely damaged on 29 December 1940

Image source: Alamy



PORT OF CALL

WHEN THE BLITZ DEVIATED FROM THE MAJOR CITIES

While London was the most heavily bombed British city during the Blitz, it was far from the only place affected. As the days passed, other towns and cities around the country found themselves subjected to the Luftwaffe's brutal attacks.

In 1941, the Luftwaffe shifted its strategy, focusing a large segment of its attentions on the country's major ports, with the aim of disrupting the production of transport links. Notably, these included the likes of Cardiff, Swansea, Hull, Southampton, Portsmouth, Bristol and Plymouth.

Many of these places suffered greatly. Bristol in particular was badly hit, seeing nearly 90,000 buildings destroyed or damaged in some way, encompassing areas like Park Street and Castle Park. The Good Friday raid of 1941 was particularly damaging, inflicting destruction on a number of residential areas and causing the permanent closure of the Bristol Tramways.

Hull was also targeted relentlessly. More than 200 deaths were caused during three nights of attacks in March 1941, with additional assaults in May causing more than 400 fatalities. Including and beyond the actual Blitz itself, Hull was proportionately the most damaged British city during the war, seeing around 95 per cent of its buildings damaged and subjected to 1,000 hours of bombing.

In Wales, the Cardiff docks and Swansea's port and oil refinery found themselves targeted. Areas including Grangetown, Cathays, Townhill and Manselton were damaged, along with iconic buildings such as Llandaff Cathedral.



Soldiers help to clear debris in Hull

"IF THE INTENT WAS TO DESTROY MORALE AND ENCOURAGE A SURRENDER, IT WAS A RESOUNDING FAILURE"

by one on 15 April. Even neutral countries weren't safe: Dublin was bombed twice (in error, for which the Nazi Government later apologised).

The Blitz continued more or less unabated from 7 September 1940 until 11 May 1941, aside from the odd gap: after 57 consecutive nights of bombing during its opening phase, attacks paused due to increasingly adverse weather conditions, and there was a mutual cessation in bombing from both sides over the Christmas period (although campaigns continued with a vengeance shortly after). In all, more than 40,000 civilians were killed during this time, around half of them in London.

Yet while the damage – both in terms of loss of life and physical destruction – was undoubtedly immense, it still stood out as a severe strategic failure from Hitler's perspective. If the intent was to savage Britain's productivity, then it didn't work. Output actually continued to increase for much of this period, only dipping slightly in April 1941 before rising again the following month. While industrial cities like Birmingham, Liverpool and Belfast were hit hard, this wasn't anywhere near enough to knock them out of the war.

If the intent was to destroy morale and encourage a surrender, that was a resounding failure too. Despite all the damage that had been inflicted, people carried on with life. Firefighters and ARP wardens were in high demand across

the country and increasingly recruited from the civilian populace. While morale understandably dropped in places – public feeling in heavily impacted locations like Portsmouth and Bristol was understandably adversely affected at the time – people generally got on with life as best they could. Bombed-out shops often opened outside their newly derelict premises, and many adopted a real gallows humour in the face of what was going on.

That's not to say all was well. Old resentments were stirred up (often in what was perceived as the London-centric coverage of the bombings), and numerous cases of looting were reported – 1,662 in October 1940 in the capital alone. The blitz also provided cover for many a career criminal, with the wholesale theft of the contents of evacuated or damaged houses particularly afflicting places like Dover and Cardiff, and protection rackets, forgery and even murder taking place under the shadow of the blackout.

So while the Blitz caused significant damage and horrendous loss of life, ultimately it didn't have any kind of serious sway on the war, despite a late flurry of attacks aimed at industrial and port areas from March to May 1941. Liverpool and Hull came in for particular punishment at this time, and a 10 May raid on central London saw around 1,436 killed. Yet Britain would not yield.

Buckingham Palace suffered nine direct hits during the Blitz




Finally recognising this, and the damage caused to the Luftwaffe (aircraft casualties rose with the increased prevalence of anti-aircraft defences), Hitler switched his attention towards Operation Barbarossa: the invasion of the USSR. To this end, in late May he withdrew Albert Kesselring's Luftflotte 2 Division, leaving Hugo Sperrle's Luftflotte 3 to carry on the raids, with submarine warfare in the Atlantic courtesy of the dreaded U-boats now the preferred method of impeding Britain's supply line.

While bombing continued sporadically throughout the rest of the war, it would never return to the same frequency. The war itself was far from over, but Britain had come through both the Battle of Britain and the Blitz still in a condition to continue the fight.

Nowhere was safe, as evidenced by this bomb damage to St Thomas' Hospital in Lambeth







**AN ARMED GUARD INSPECTS A
PIECE OF DEBRIS FROM A DORNIER
BOMBER THAT CRASHED ON A ROOF,
SEPTEMBER 1940.**



LEGACY OF THE BATTLE

FORGOTTEN HEROES OF THE BATTLE OF BRITAIN

WORDS NICK SOLDINGER

In the summer of 1940 Hitler was on the verge of becoming master of all of Europe. But the Royal Air Force stood between him and total victory



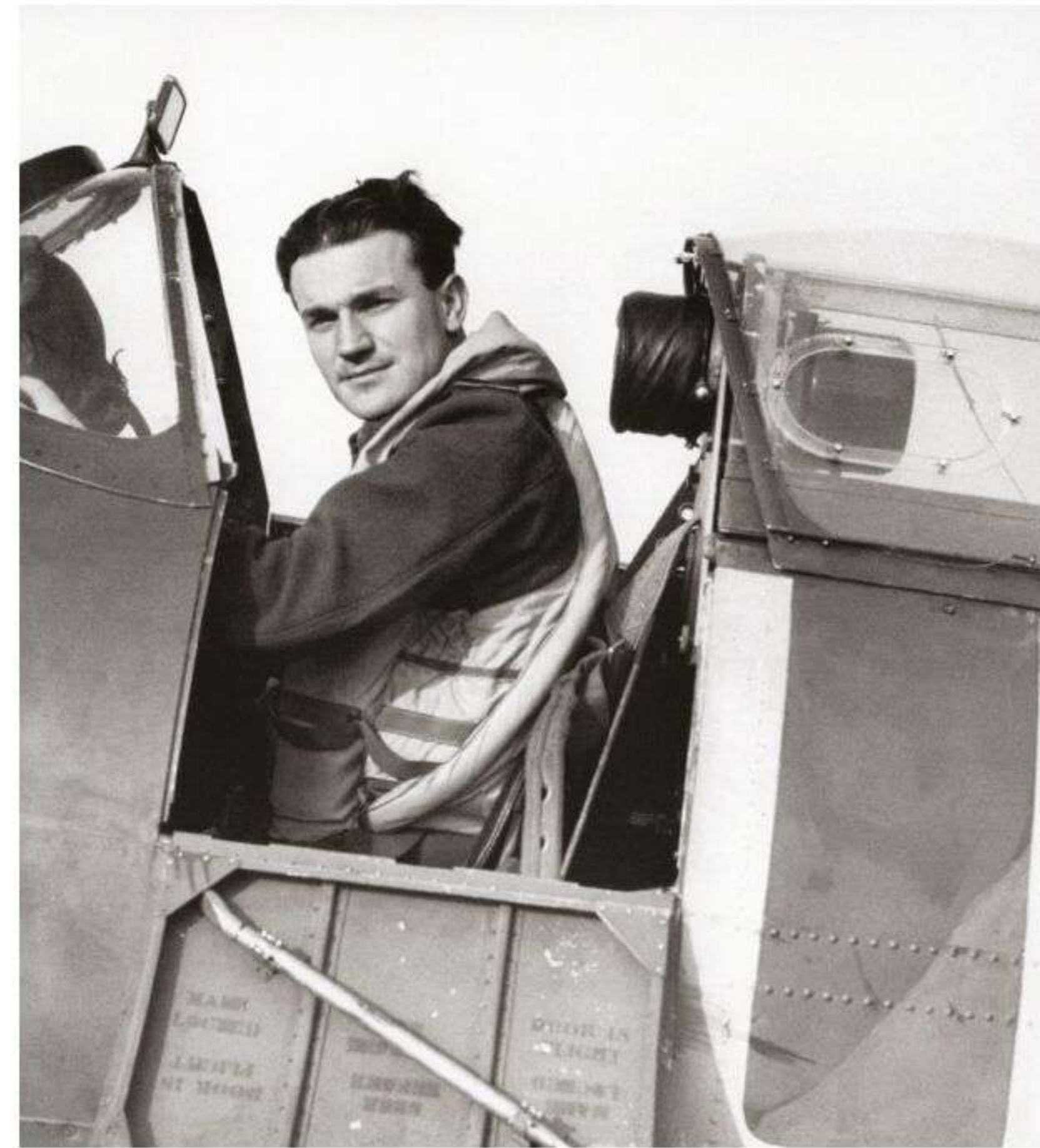
On 18 June 1940 Winston Churchill stood up in Parliament. The mood was gloomy. France had just surrendered, most of Europe was now under Nazi control, and Britain faced a rampant Germany alone. "The Battle of France is over," he announced. "The Battle of Britain is about to begin. Hitler knows he must break us in these islands or lose the war. If we can stand up to him, all Europe may be freed. But if we fail, then the whole world will sink into the abyss of a new dark age."

Churchill had been warning of war for years but few had listened. The Nazis had spent much of the 1930s building the modern war machine that had just ravaged most of Europe. By contrast, British rearmament had only begun in earnest just six months before the conflict began. What little preparations had been made, however, would prove to be enough. But only just.

Hitler's planned seaborne invasion of the British Isles, codenamed Operation Sealion, was risky. To succeed, the German Luftwaffe needed to first gain complete air superiority. Although the campaign began on 10 July, the true purpose of it wouldn't become apparent until Hitler's so-called 'Eagle Day' on 13 August. Between those two dates, skirmishes over the Channel, as the Luftwaffe picked off British shipping convoys, disguised the fact that on the mainland two huge air fleets were being assembled at newly captured airfields.

By the time Eagle Day arrived, the Germans had amassed about 3,000 aircraft with the aim of annihilating the RAF and its 660 serviceable fighters. All that now stood between Hitler and his new dark age were the courageous souls who would take on that monstrous armada. Most of them were barely out of their teens, and history would come to remember them as 'the Few'.

Finucane's heroism soon spread beyond RAF ranks. Models of his Spitfire, with its distinctive Irish shamrock nose art, were even sold in toy shops



BRENDAN FINUCANE

NATIONALITY: IRISH

RANK: FLYING OFFICER, 65 SQUADRON

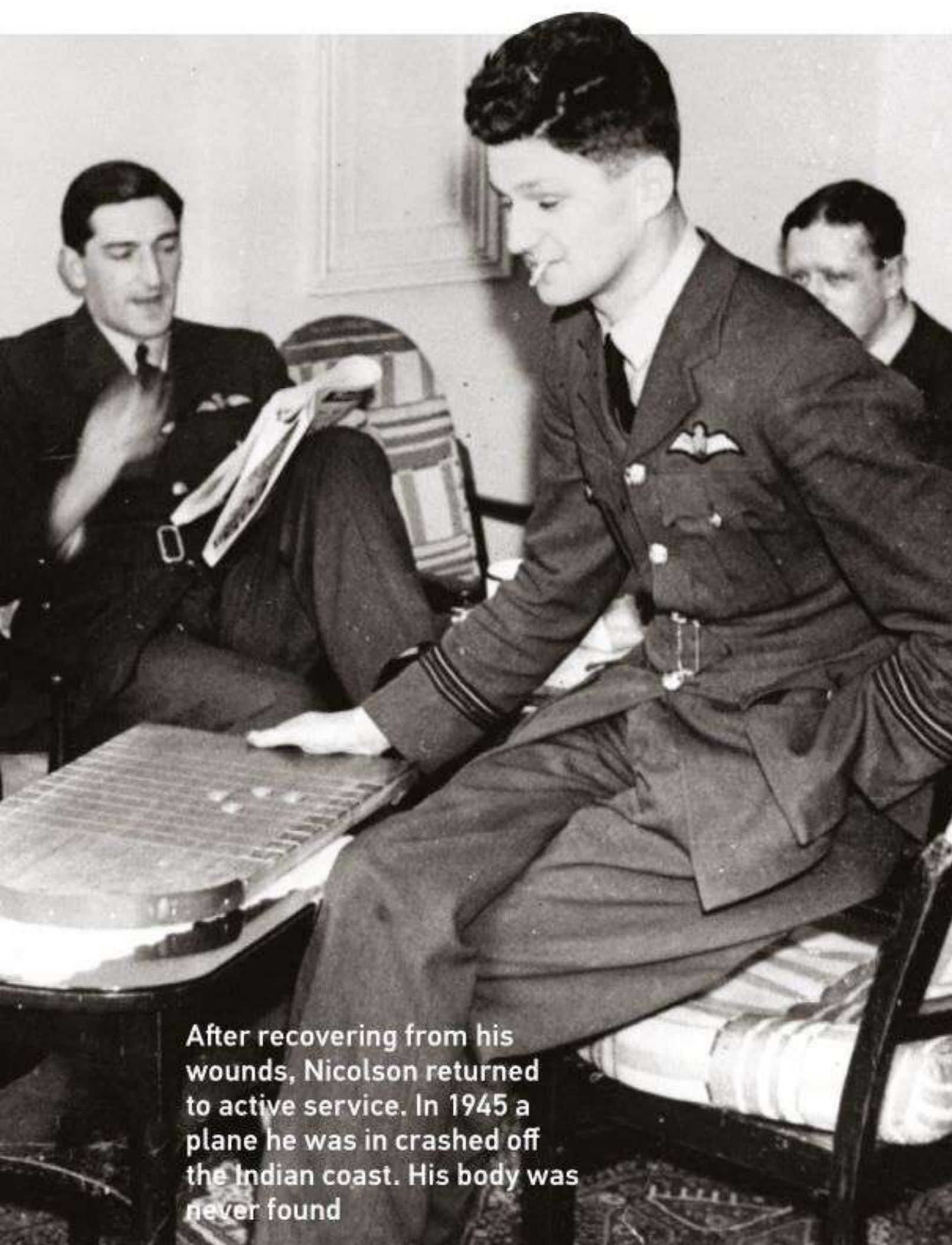
HE'D GO ON TO BECOME A POSTER BOY FOR THE RAF, BUT THE CAREER OF THIS LEGENDARY FIGHTER PILOT ALMOST DIDN'T GET OFF THE GROUND

12 August 1940, the day before Eagle Day, witnessed the first major bombing of an RAF airfield as Luftwaffe units probed inland, testing Fighter Command's resolve before the battle ahead. That day, RAF Manston in Kent was playing host to 65 Squadron, and among its ranks was Brendan Finucane. The son of an IRA man, the enigmatic Finucane would go on to become one of Fighter Command's greatest aces, but the 19-year-old pilot was lucky to survive the Luftwaffe's opening gambit.

With news that a significant force was headed their way, 65 Squadron's pilots scrambled. Finucane and his pals sprinted to their Spitfires and clambered into their cockpits. As they were preparing for take off, however, dozens of German fighters and bombers appeared overhead. Hangars, workshops and vehicles began exploding all around them. As Finucane raced to get off the ground craters began appearing in the runway before him.

Miraculously, however, he got airborne, as did all but one of his comrades. Within minutes they were hurtling through the skies, chasing the Germans back across the Channel. By the time Finucane landed he'd shot down the first of what would be many enemy aircraft. By the time the swashbuckling Dubliner was killed in action two years later, he'd added a further 27 kills. In those dark days Britain was desperate for heroes, and Finucane's bravery had made him famous. More than 3,000 grateful Britons attended his funeral mass to pay their respects.





After recovering from his wounds, Nicolson returned to active service. In 1945 a plane he was in crashed off the Indian coast. His body was never found

JAMES BRINDLEY NICOLSON

NATIONALITY: ENGLISH

RANK: FLIGHT LIEUTENANT, 249 SQUADRON

FIGHTER COMMAND'S SOLE RECIPIENT OF THE VICTORIA CROSS, NOT JUST OF THE BATTLE OF BRITAIN BUT OF THE WHOLE OF WORLD WAR II

Despite the extraordinary heroism of the Few, just one of their rank received Britain's highest military honour, the Victoria Cross. When you're fighting alone high above the clouds, finding witnesses to corroborate individual acts of valour can be tough. In James Nicolson's case, however, his heroics happened low enough to be seen by astonished observers on the ground.

By 16 August the German raids were relentless. British losses were mounting and things were getting desperate. Around noon a wave of German planes descended on Southampton. Hurricanes from 249 Squadron were scrambled to intercept them. Among the pilots was 23-year-old Nicolson. Moments into the fray he was jumped by German fighters. Bullets smashed into his plane, hitting his left eye and foot. The petrol tank was also hit. Fuel poured into the cockpit, where it was ignited by the engine. With his cockpit ablaze, Nicolson slid back to bail out, but at that moment an enemy bomber swung in front of him. Despite his plane fast becoming a fireball, Nicolson climbed back into his seat. With only one good eye, up to his waist in flames and his hands blistering on the controls, he closed in on the German plane. Only when he'd destroyed it did the badly burned Londoner bail out, landing unconscious outside Southampton.

GEOFFREY WELLUM

NATIONALITY: ENGLISH

RANK: PILOT OFFICER, 92 SQUADRON

HE WAS JUST 18 WHEN THE BATTLE OF BRITAIN STARTED AND OFFICIALLY THE RAF'S YOUNGEST FIGHTER PILOT

Geoffrey Wellum's first sorties as a Spitfire pilot had come in May 1940, covering the evacuation of the British army from Dunkirk. He then flew several sorties a day from his base at Biggin Hill, Kent, during the opening part of the Battle of Britain, protecting shipping in the Channel. Nothing, however, could prepare the teenager for what he was to witness on 13 August 1940, when the Luftwaffe sent a flying armada of 1,500 aircraft to destroy RAF bases.

In his 2009 memoir, *First Light*, Wellum vividly recalls the spectacle he encountered. "Within seconds we're among them," he wrote, "each man for himself, fighting his own private battle."

Things move terribly quickly. There seem to be hundreds of aeroplanes with everybody shooting at everybody else. I am taken by surprise by the sheer size of this battle in this tremendous arena. Wherever I look the sky is full of aircraft.

"I clamber for height and I have an uninterrupted view. It's magnificent yet appalling. Junker and Heinkel bombers split up, their formations largely decimated, as they head back towards the coast. A Junkers goes down well and truly on fire.

"Yet another plummets to the ground. Three of the crew bail out and only one chute opens, the other two Roman candle. I can see the man at the end of one quite clearly, arms and legs thrashing as he plunges earthwards.

"A Spitfire spins down and a Hurricane dives away, a long trail of black smoke behind it and, at its base, a bright angry red flame. I am transfixed. I don't see anyone bail out. Yet another aircraft goes down in a steep dive. A large one, looks like a Heinkel. My God he's shifting for a big plane and, oh goodness, streaming out behind is a man on the end of a parachute, caught up round the tail and flailing about like the tail of a kite. He may be a Hun, but I would not wish a death like that on anyone."



Decorated for heroism, the huge psychological strain of aerial warfare eventually told on Wellum (back row, right). He was withdrawn from combat operations in 1943

ELSPETH HENDERSON

NATIONALITY: SCOTTISH

RANK: CORPORAL, WOMEN'S AUXILIARY AIR FORCE (WAAF)

THE WEE YOUNG WOMAN FROM EDINBURGH WHO PROVED SHE WAS AS BRAVE AS ANY MAN

Without women like Elspeth Henderson and the Dowding System that she helped operate, Fighter Command would have soon succumbed to the mighty Luftwaffe. Named after Air Chief Marshal Hugh Dowding, the system was the world's first ground-controlled interception network. It linked observation posts and newly developed radar stations via phone lines to airfields and anti-aircraft batteries. Its ability to forewarn of attacks meant already overstretched squadrons didn't need to constantly patrol the skies but could instead be scrambled in a heartbeat. Its role was to prove pivotal, and people like 27-year-old Henderson soon found themselves on the front line using it.

Towards the end of August, RAF Biggin Hill, where Henderson was stationed, was under daily attack. On 30 August, one raid hit a shelter there killing 39 and entombing many others. Henderson was among the first to start digging them out.

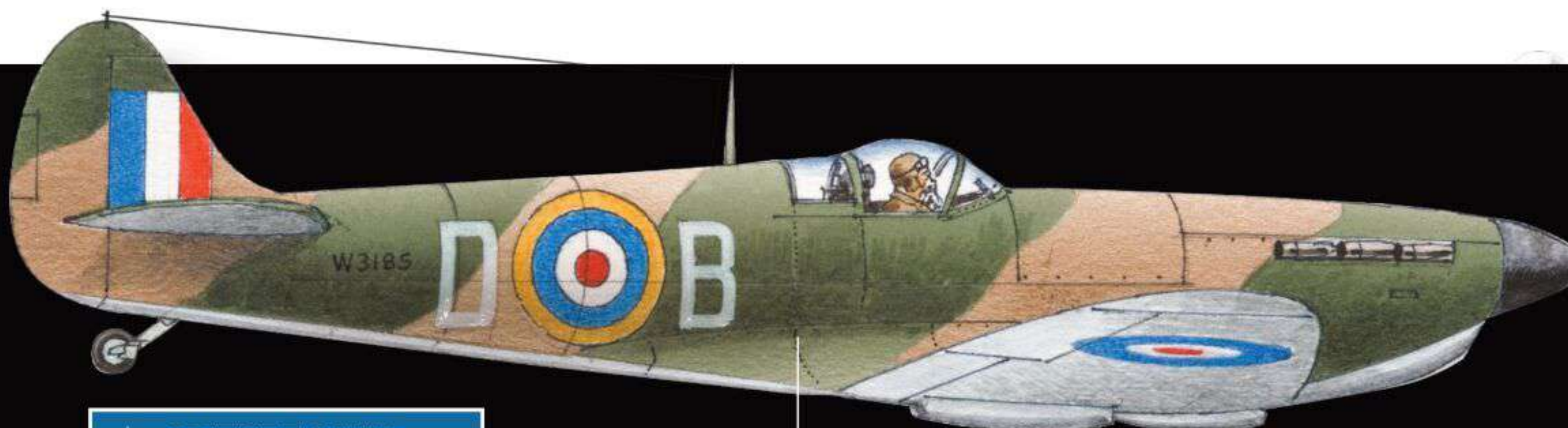
The following day, as she was managing the phones in the operations room, the bombers returned. This time they scored a direct hit on the building that she was in. It was engulfed in flames and the survivors were ordered to evacuate. Henderson, however, remained at her post and continued to pass on vital information. Only when the smoke became overwhelming did she escape via a shattered window.

Just six women in the WAAF won the Military Medal during the course of the war. Henderson was one of them. Her citation noted that she had been awarded it for displaying "courage of an exemplary order."



Henderson with Air Chief Marshal Dowding. Houses now stand where RAF Biggin Hill once did, and Henderson has a road there named after her

THE BATTLE OF BRITAIN AT A GLANCE

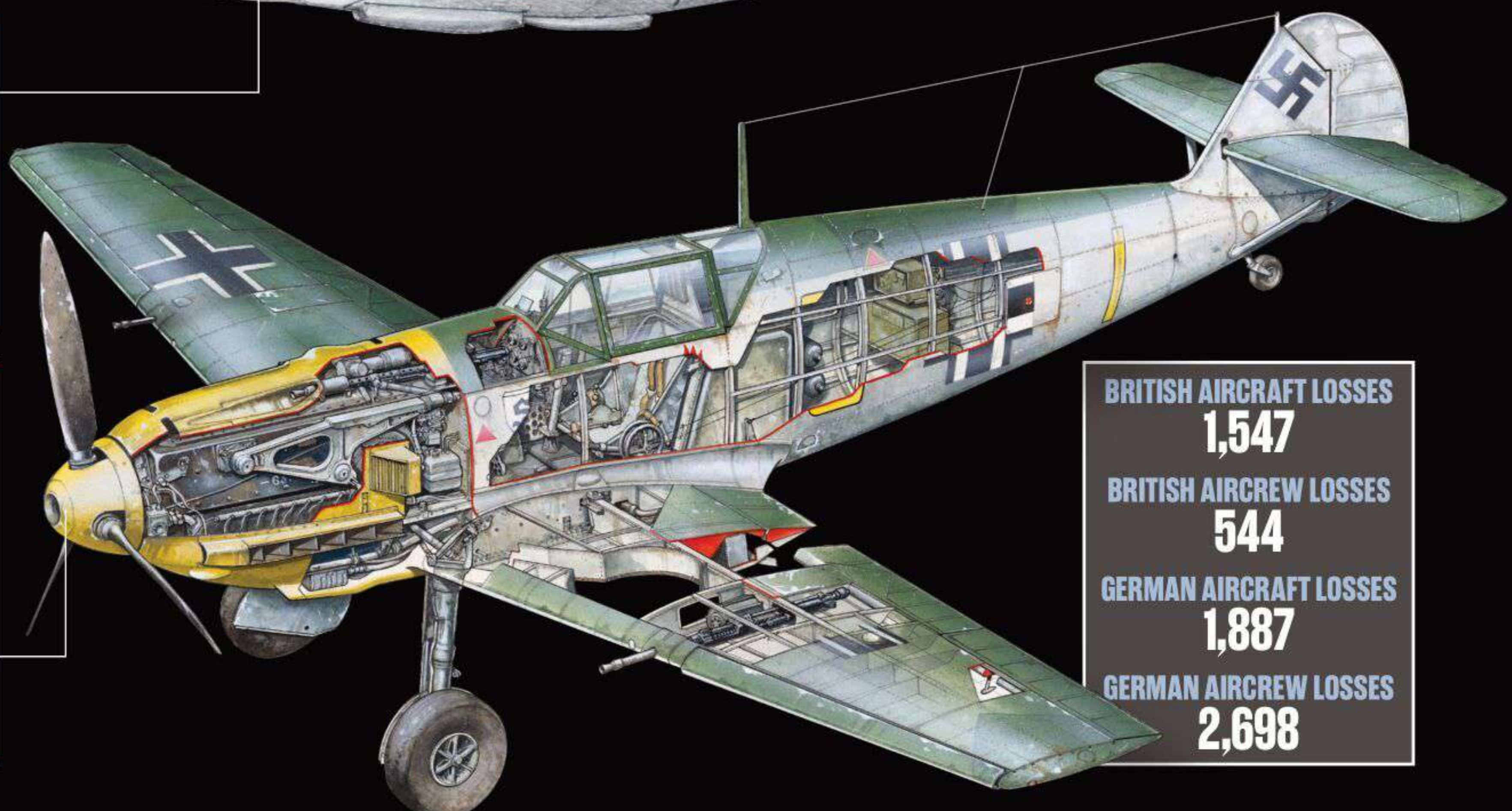


★ SPITFIRE MK1A

ENGINE ROLLS-ROYCE MERLIN
1800HP V12 MK III
WINGSPAN 11.23M (36FT 10IN)
MAX SPEED 582KM/H (362MPH)
ARMAMENT 8 X .303
BROWNING MK II MACHINE GUNS
RANGE 680KM (425MI)

✠ MESSERSCHMITT BF 109E

ENGINE DAIMLER-BENZ 1200HP
V12 605D
WINGSPAN 9.91M (33FT)
MAX SPEED 553KM/H (343MPH)
ARMAMENT 1 X 30MM MK108
CANNON, 2 X 13MM MG17
MACHINE GUNS
RANGE 660KM (410MI)



BRITISH AIRCRAFT LOSSES

1,547

BRITISH AIRCREW LOSSES

544

GERMAN AIRCRAFT LOSSES

1,887

GERMAN AIRCREW LOSSES

2,698



After the campaign, Sergeant Lacey was promoted to Pilot Officer. He ended the war with a final tally of 28 confirmed kills and four probable kills

JAMES LACEY

NATIONALITY: ENGLISH
RANK: FLIGHT SERGEANT, 501 SQUADRON

THIS FARM WORKER'S SON FROM YORKSHIRE TOOK HUGE RISKS TO BAG 18 KILLS AND BECAME THE HIGHEST-SCORING LOWER-RANK PILOT OF THE BATTLE OF BRITAIN

By 30 August, as the campaign neared its height, 23-year-old James Lacey was heading back to the coast after a dogfight that had left his plane riddled with 87 bullet holes. While still over the sea his engine gave out. Lacey had bailed out before, but this time he was determined to get his Hurricane home.

Figuring that he had just enough altitude, he decided that he would attempt to glide back to land – a distance of some 24 kilometres (15 miles). Incredibly, his gamble paid off. Not only did Lacey manage to reach land, but he was able to put his plane down perfectly on the runway at RAF Gravesend.

"I was lucky," Lacey later recalled. "I was shot down nine times in the 16 weeks the Battle of Britain lasted. I once jumped from a plane that was burning end to end, and once from one that had no tail left. Waiting to go up terrified me. Waiting for that Tannoy to say 'scramble!'. It could make me physically sick. I didn't have butterflies in my stomach back then, I had vultures."

ANATOMY OF A WWII RAF FIGHTER PILOT

TYPE B FLYING HELMET

Made from leather, lined with chamois and with a layer of cotton padding between, each helmet was customised by the airbase tailor so that the earpieces fitted the wearer.

MK II FLYING GOGGLES

The brass frames were usually blackened and the backs of them trimmed around the edges with faux-fur for extra comfort. The laminated lenses also had a blue-green tint to deal with sunshine.

OXYGEN MASK AND MICROPHONE

The wool and chamois oxygen mask was fitted to the helmet with four snap fasteners. The front of the mask housed both the inlet for the oxygen tube and the attachment point for the microphone.

IRVIN JACKET

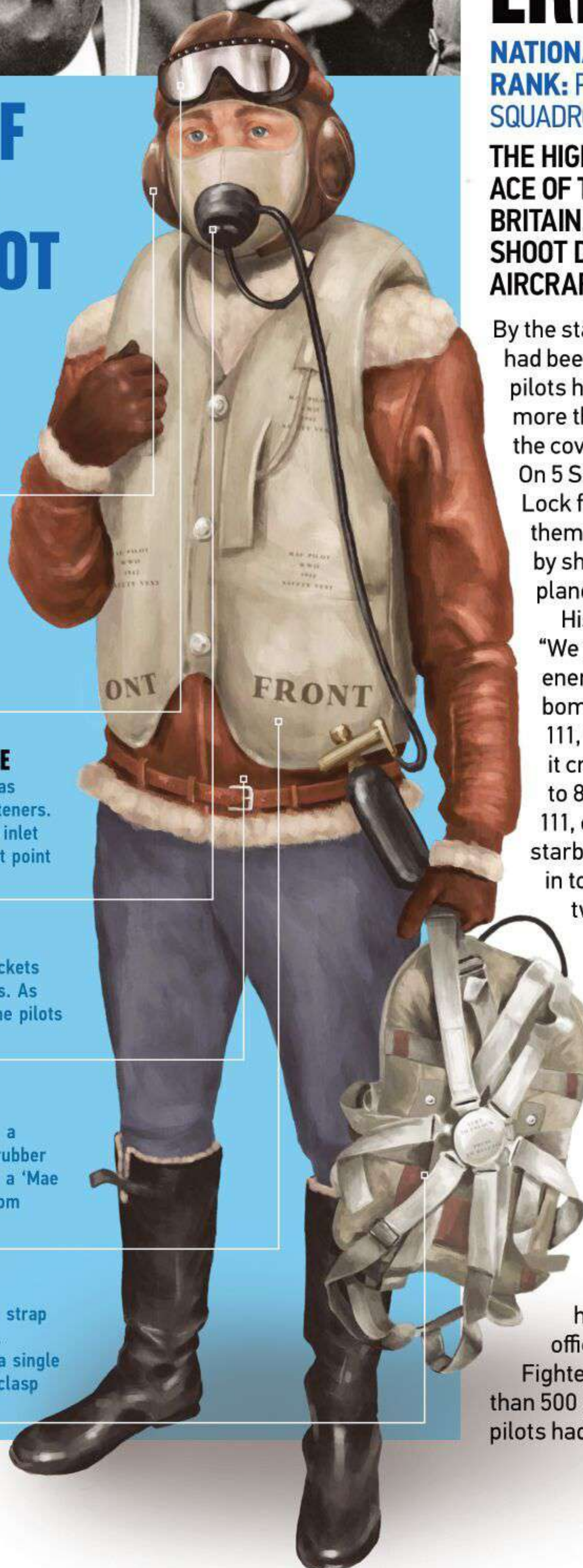
With no in-plane heating, sheepskin jackets were worn over the top of the uniforms. As the collars could restrict visibility, some pilots would cut them off.

LIFE VEST

Being shot down over the Channel was a real risk, so pilots wore a cotton and rubber inflatable life vest. Pilots nicknamed it a 'Mae West' in honour of the notoriously buxom Hollywood star of the day.

C-2 PARACHUTE

Pilots would grab their parachutes and strap them on shortly after being scrambled. Shoulder, waist and leg straps met at a single point and clipped into a quick-release clasp on the chest.



Lock shot down 26 enemy aircraft during the campaign

ERIC LOCK

NATIONALITY: ENGLISH
RANK: PILOT OFFICER, 41 SQUADRON

THE HIGHEST-SCORING RAF ACE OF THE ENTIRE BATTLE OF BRITAIN, LOCK MANAGED TO SHOOT DOWN THREE ENEMY AIRCRAFT IN ONE BRIEF SORTIE

By the start of September, combat had been so intense that many pilots had already notched up more than five kills, giving them the coveted title of 'Fighter Ace'. On 5 September, 21-year-old Eric Lock from Shrewsbury joined them when he added to his tally by shooting down three enemy planes in a matter of minutes.

His combat report reads, "We intercepted a formation of enemy aircraft, attacking the bombers first I engaged a He 111, which I followed down until it crashed. I climbed back up to 8,000 feet, saw another He 111, engaged that and set his starboard engine on fire. I closed in to about 75 yards and fired two long bursts. Smoke came from the fuselage. I was then attacked by a Me 109 who wounded me in the leg. As he banked away, he stall-turned. I fired at him. He exploded in mid-air."

The understated tone of Lock's report belies the true terror of the deadly game of cat and mouse that was being played out in the clouds. By the time his squadron intelligence officer had typed this report up, Fighter Command had lost more than 500 planes, while nearly 250 pilots had lost their lives.



A DAY IN THE LIFE OF A BATTLE OF BRITAIN PILOT

FROM DAWN UNTIL DUSK EVERY DAY FOR 16 WEEKS, FIGHTER COMMAND'S PILOTS HAD TO BE READY TO MEET THE GERMAN THREAT IN THE SKIES

04.00hrs Woken at dawn



All fighter pilots' days started at dawn with a cup of tea brought to them by a junior rank. They wash and dress before being driven in lorries to the dispersal area. Here, by the runway, they eat breakfast – if they have the time – and wait.

10.00hrs "Scramble!"



By mid-morning, the radar stations start picking up incoming enemy aircraft. The dispersal area phone rings. The duty officer answers, nods his head, then clicks on the Tannoy and shouts "Scramble!" into the receiver and across the airfield.

10.07hrs Into the air



Having raced to their planes, clambered into their parachutes and climbed into their aircraft, which fitters will already have started for them, pilots begin to taxi down the runway and take to the air.

10.10hrs Mission briefing



With the planes now airborne, through their headphones they hear "vector two five zero, bandits 200 plus, angles three zero", which is code for them to steer a course for 250 degrees, where more than 200 enemy aircraft are incoming at 30,000 feet.

10.15hrs Bandits dead ahead



Enemy planes are spotted heading in from the east with the Sun behind them. A dogfight begins as planes begin one-on-one duels with the German fighters or go after the slow-moving bombers that are bristling with guns.

10.40hrs The fight ends



German fighters can only fight over English airspace until their fuel starts running out. The RAF pilots then either chase them back over the Channel or pick off any remaining bombers.

11.00hrs Return to base



Those pilots that haven't been shot down return to base. Upon landing they are interviewed by an intelligence officer, who compiles a combat report detailing any enemy and RAF planes that have been shot down or damaged.

15.00hrs Second duel of the day



Pilots are scrambled again. At the height of the campaign, pilots flew combat missions two or even three times a day.

20.00hrs Dismissed at dusk



As dusk approaches, after 16 long hours of suspense punctured by minutes of extreme violence in the skies, the pilots are stood down. Those who have survived end their day with a pint at the local.

FORGOTTEN HEROES OF THE BATTLE OF BRITAIN

Bader was shot down over France in 1941 and captured. While a POW he tried to escape so often that the Germans ended up confiscating his tin legs



DOUGLAS BADER

NATIONALITY: ENGLISH

RANK: SQUADRON LEADER, 242 SQUADRON

THIS LEGENDARY ACE LOST BOTH HIS LEGS IN A PRE-WAR FLYING ACCIDENT, BUT THAT DIDN'T STOP HIM FROM HELPING TO TURN THE BATTLE IN BRITAIN'S FAVOUR

At the age of 30, Douglas Bader was older than most RAF pilots, and his leadership was to prove inspirational to the younger men under him. This was especially true when, on 15 September, the Luftwaffe launched its largest attack against London in the mistaken belief that Fighter Command was so stretched it could destroy its remaining aircraft in one go. The skies were filled that day with 1,500 aircraft and the dogfights lasted until dusk.

With the fighter squadrons attacking in 'big wing' formations of up to 60 planes – a tactic Bader endorsed – the RAF inflicted

colossal damage on the Luftwaffe at little cost to themselves. For Bader it would prove a particularly successful day.

Just after noon, his wing ran into a great mass of aircraft, both British and German, outside of London. In fact, the skies were so busy that, according to the report he later gave an intelligence officer, his wing "had to wait until Spitfires and Hurricanes engaging the enemy broke away". Once they had, Bader sent his Spitfire force to attack the German fighters, while he and his Hurricane pilots got stuck into the bombers.

Typically Bader led from the front, most of the time getting the first kill. His report reveals "[Bader] opened fire at 100 yards in a steep dive, and saw large flash behind the starboard motor of the Do 17 as its wing caught fire. He attacked another E/A (enemy aircraft) but it was difficult to get them in his sights as the sky was so full of Hurricanes queuing up to attack E/A. As all the bombers were destroyed S/Ldr Bader's comments are worthy of repetition. 'It was the finest shambles I've been in. For once we had position, height, and numbers.' He was right – 15 September proved to be the tipping point of the entire campaign.



Żak settled in Britain after the war. His medals, including the DFC he's being awarded here, can be seen today at London's Imperial War Museum



WALERIAN ŻAK

NATIONALITY: POLISH

RANK: FLYING OFFICER, 303 SQUADRON

THE PILOT WHO WAS FIGHTING TO FREE HIS HOMELAND FROM THE ONLY PLACE LEFT THAT HE COULD STILL TAKE ON THE NAZIS

The men who flew with the legendary 303 Squadron were largely exiled Poles, men who'd seen first hand what the Nazis did to countries they conquered. Many also had families in occupied territory, and this may partly explain their fearsome reputation and never-say-die attitude. Walerian Żak, who'd go on to lead the squadron, summed up these qualities during fighting over Sussex on the morning of 27 September.

Żak's was one of 11 Hurricane pilots who attacked a bomber formation that was protected by a mass fighter escort. Despite being heavily outnumbered, they shot down 15 aircraft including seven bombers.

But the kills didn't come without cost. Two pilots were killed and Żak's own plane was so badly shot up that it caught fire. As did he. Bailing out was his only option, but fearing his parachute would catch fire too, Żak elected to free fall thousands of feet in the hope it'd extinguish the flames. His gamble worked and, though badly burned, the 29 year old then opened his parachute and landed safely.



ALBERT GERALD LEWIS

NATIONALITY: SOUTH AFRICAN

RANK: FLYING OFFICER, 504 AND 249 SQUADRONS

THE COURAGEOUS SON OF EMPIRE WHO GAVE NEARLY EVERYTHING TO DEFEND WHAT HE WOULD HAVE CALLED THE MOTHER COUNTRY

As well as Britain and Europe, Fighter Command pilots came from all over the British Empire. One of the finest was South African Albert Lewis, and as the campaign began drawing to a close at the end of September, he experienced the best and worst that life as an RAF fighter ace offered. On 27 September, he shot down an astonishing six aircraft in one day, taking his tally for the war to 18. The very next day, however, he was shot down himself.

While returning from a patrol, the 22 year old was jumped by a pack of German fighters. His plane was

hit at 30,000 feet. Shrapnel tore through his legs and his Hurricane caught fire. Flying at 563 kilometres (350 miles) per hour, the blaze soon whipped up into an inferno. "When I pulled back the canopy," he later recalled, "the flames roared up around my face. I pulled the release of my harness and got out. The suddenness with which I parted company with the plane caused me to be shaken around like an old rag."

Lewis landed safely but had suffered severe burns. His eyes were so badly scorched that he was blind for two weeks.



Despite his injuries, Lewis returned to active service within three months of being shot down. He later served in the Far East and survived the war



The plane that Holmes rammed out of the sky hit shops close to Victoria Station. His plane crashed nearby at Ebury Bridge on Buckingham Palace Road

RAY HOLMES

NATIONALITY: ENGLISH **RANK:** FLIGHT SERGEANT, 504 SQUADRON

THIS PILOT'S HEROICS SAVED BUCKINGHAM PALACE FROM CERTAIN DESTRUCTION – AND HE DID IT WITHOUT BULLETS

By 11 October the Battle of Britain was over. While Hitler hadn't officially cancelled the invasion of Britain, he had formally postponed it. It marked a true turning point in the war. It was Nazi Germany's first defeat and proof that the Führer's ideologically driven forces weren't invincible.

What didn't stop, however, was the bombing of Britain, which would only intensify over the next seven months as the Battle of Britain dovetailed into the Blitz.

London had first been bombed on 24 August, accidentally and against the express orders of Hitler himself, as it turned out. But the revenge bombing of the city of Berlin by the RAF the very next day so infuriated him that the focus of the Battle of Britain was switched from destroying Fighter Command and its bases to destroying Britain's infrastructure. It was to prove a costly error. The great raids sent to terrorise London began in earnest on 7 September, and they soon became a regular occurrence.

On Sunday 15 September at 11.30am, a force of 100 bombers and 200 fighters approached London. As they were tracked by the radar station at Uxbridge, where Churchill just happened to be visiting the operations room that day, 250 fighters were despatched to deal with them.

By noon, the surviving bombers arrived over central London. Here, they were engaged by Hurricanes from 504 Squadron. One was being piloted by 24-year-old Ray Holmes, who attacked several bombers before latching onto a badly

damaged one heading straight for Buckingham Palace. Holmes wasn't to know, but the plane was actually unmanned. It'd been so badly shot up over south London that its crew had bailed out. Its pilot, Oberleutnant Robert Zehbe, had left the plane on a fixed course before parachuting to what he thought was safety. Coming down near the Oval cricket ground, however, he was attacked by an angry mob and later died of his wounds.

Crewless it may have been, but Zehbe's bomber still had a full payload, enough to obliterate the palace. Holmes closed in behind it, lined it up in his sights, and pressed the Hurricane's trigger. But he was out of ammo. The young Liverpudlian then made a desperate decision. "There was no time to weigh up the situation," he revealed afterwards. "[The German] aeroplane looked so flimsy. I just went on and hit it for six. I thought my plane would cut right through it."

Flying at more than 643 kilometres (400 miles) per hour, Holmes rammed the German bomber's tail. It caused his Hurricane to plunge into a steep nosedive. He was forced to bail out, but the impact had also snapped the bomber in two and flipped the remaining fuselage over so wildly that the G-force ripped both its wings off.

The bomb load then fell free, and although part of it did hit the palace, the bulk missed, while the plane itself was knocked clear. It ended up crashing by Victoria Station without further loss of life. Holmes' staggering courage had ensured a vital part of Britain's heritage would survive the war.



GERMANY'S FIGHTER ACES

WITH 111 KILLS BETWEEN THEM, THE TOP THREE LUFTWAFFE PILOTS ACCOUNTED FOR SEVEN PER CENT OF ALL RAF LOSSES

Oberleutnant Helmut Wick

Battle of Britain kills: 42

Wick was the highest-scoring pilot of the entire Battle of Britain. The 25 year old became only the fourth member of the German armed forces to be awarded the King's Cross of the Iron Cross with Oak Leaf Clusters. He was killed in combat over the Channel in November 1940.



Major Adolf Galland

Battle of Britain kills: 35

Galland would go on to become the youngest general in the German military, attaining the rank of general of the fighter arm in 1941. His total number of kills for the war was 104, despite being banned from combat from December 1941 to the end of 1944 due to his status.



Hauptman Walter Oesau

Battle of Britain kills: 34

By the time the Battle of Britain started Oesau was already a veteran of the Spanish Civil War, the invasion of Poland and the Battle of France with 14 kills. By the time he was killed in May 1944 by an American pilot, he'd extended that tally to 127.





THE COST OF DEFEAT

WORDS JAMES HORTON

How Britain's perseverance helped to lay the foundations for an Allied victory

Hitler was well known among the Nazi leadership as an optimist, or, perhaps more accurately, an over-optimist. Like many successful war chiefs before him, the Führer was known to take military gambles. However, unlike the great military minds before him, Hitler lacked the ability to implement his grand schemes, instead leaving the problem of achieving his mighty ambitions to his generals. Prior to the Battle of Britain, they had delivered. The Luftwaffe had crushed the Poles within days; the panzer divisions had stormed through the Low Countries and enveloped the beleaguered French within weeks. When Hermann Göring, Commander-in-Chief of the Luftwaffe, assured Hitler that his aircraft would swiftly destroy Britain's Royal Air Force and bring the country to heel, the Führer had little reason to doubt him. The Germans had rapidly overwhelmed every enemy they'd faced so far, so why would Britain be any different?

By 15 September 1940, the climax of the Battle of Britain, the German leadership firmly understood

that Britain was a different beast to those they'd faced before. The RAF had mounted a rugged and adamant defence of its homeland, inflicting terrible losses on the Luftwaffe. Such was the damage that the Nazi leadership accepted that they would be unable to eradicate the RAF. The German air force switched tactics to night-time bombing raids. The Battle of Britain ended on 31 October, but sadly the Blitz had only just begun.

The failure to defeat the British did not immediately hamper the German war effort. From Hitler's perspective, although his army could no longer invade Britain, his primary objective of enforcing its surrender remained a seemingly attainable goal. There were multiple ways to force his enemy to capitulate, and if destruction of their armed forces and capturing their cities was no longer an option, obliterating their morale through bombing raids could achieve the same aims, albeit over a longer timeframe. Others in the Nazi regime may have been feeling yet more optimistic, as Hitler's ambitious plan to invade Britain under



Some historians believe that, if Germany had defeated Britain in 1940, the US, led by President Franklin D. Roosevelt, would have been discouraged from coming to Europe's aid

Image source: Getty Images



The Luftwaffe's failure to destroy the RAF had much wider implications than simply preventing a German land invasion of Britain



“WHEN GÖRING ASSURED HITLER THAT HIS AIRCRAFT WOULD SWIFTLY DESTROY BRITAIN’S ROYAL AIR FORCE AND BRING THE COUNTRY TO HEEL, THE FÜHRER HAD LITTLE REASON TO DOUBT HIM”



A GAMBLER'S CHANCE

HOW HITLER COULD HAVE IMPROVED HIS CHANCES OF DOMINATING ENGLAND'S SKIES



Prof. Niall MacKay

Sometimes in history military victories are poised on a knife edge. But was this the case for Britain and Germany in 1940? At the level of their pilots and aircraft, the two opposing sides were evenly matched. But above them in hierarchy, albeit not in altitude, the same cannot be argued for the grand strategists leading the air force. Many historians have attributed Germany's failure to achieve aerial dominance on Hitler's and Göring's ineffectual tactics. But how likely was a German victory if the plan of action had been different?

Rather than rely on qualitative speculation, researchers at the University of York decided to search for a quantitative answer using a statistical test known as a weighted bootstrapping. The researchers simulated the impact of various Luftwaffe approaches using data from the actual battle. These included fighter pilot strength, losses and replenishment rate, the number of sorties on a given day, and

the intended target of German bombing. For their tests, Niall MacKay and his colleagues tested several counterfactual scenarios; where the Luftwaffe continued to bomb RAF installations instead of switching their focus to London; the Luftwaffe had ignored London entirely; the Germans began their air offensive three weeks sooner; or a combination of these factors.

The outcome of the tests was striking. Individually, each of the three scenarios significantly lowered the chance of a British victory. The Luftwaffe not switching focus to London would have been a boon to German prospects, and they could have fared even better by not bothering with the English capital at all. However, mounting an earlier assault by three weeks was simulated to be the most damaging to Britain. Even if we assume a generous 97.7 per cent chance of British victory in the historical timeline, an earlier attack reduced this chance to a measly 18 per cent. If the German high command had combined an early attack whilst focusing bombardment on RAF installations, it was calculated to have all-but ensured a German victory by knocking the British win chance to 0.4 per cent.

"IF THE LUFTWAFFE HAD BEGUN THEIR OFFENSIVE THREE WEEKS EARLIER, THE BRITS' CHANCE OF VICTORY WOULD'VE BEEN 18%"

Operation Sealion was now squandered as the RAF remained able to provide air support during an attempted Channel crossing. The feasibility of Operation Sealion was dubious even if the Germans *had* achieved complete control of the air. The practicalities of loading enough of the German army onto boats so as to threaten the British mainland meant that the soldiers would have been transported via adapted barges pulled by tugboats. These seacraft would have been immensely vulnerable to the Royal Navy, whose destroyers could topple the barges by merely sailing past at speed. And if the threat of generated waves wasn't enough, the firepower of smaller British Navy craft would likely have torn the fledgling armada to pieces while simultaneously evading bombing runs from the Luftwaffe. Losing the Battle of Britain, at first glance then, may have appeared to some as a boon to the German war effort by ultimately sparing their army.

To purely focus on minimising German losses, however, would be to ignore the incredible advantages that would have been garnered by a British capitulation. Operation Sealion might not have been achievable, but by crushing the RAF the British morale would have suffered a severe blow. The Foreign Secretary, Lord Halifax, who sat on Winston Churchill's war cabinet (and had been the former Prime Minister Neville Chamberlain's first choice as his successor) was susceptible to advocating surrender. Following the Germans' success in France, Halifax was a vocal supporter of discussing peace terms with the Nazi regime, perhaps by using the Italians as mediators. It is reasonable to speculate that if the RAF had been eviscerated as Göring had so confidently predicted, the call for peace terms may have been overwhelming for Churchill. The

Vast swathes of Germany were devastated by Allied bombing, raids only made possible because Britain remained as a launchpad

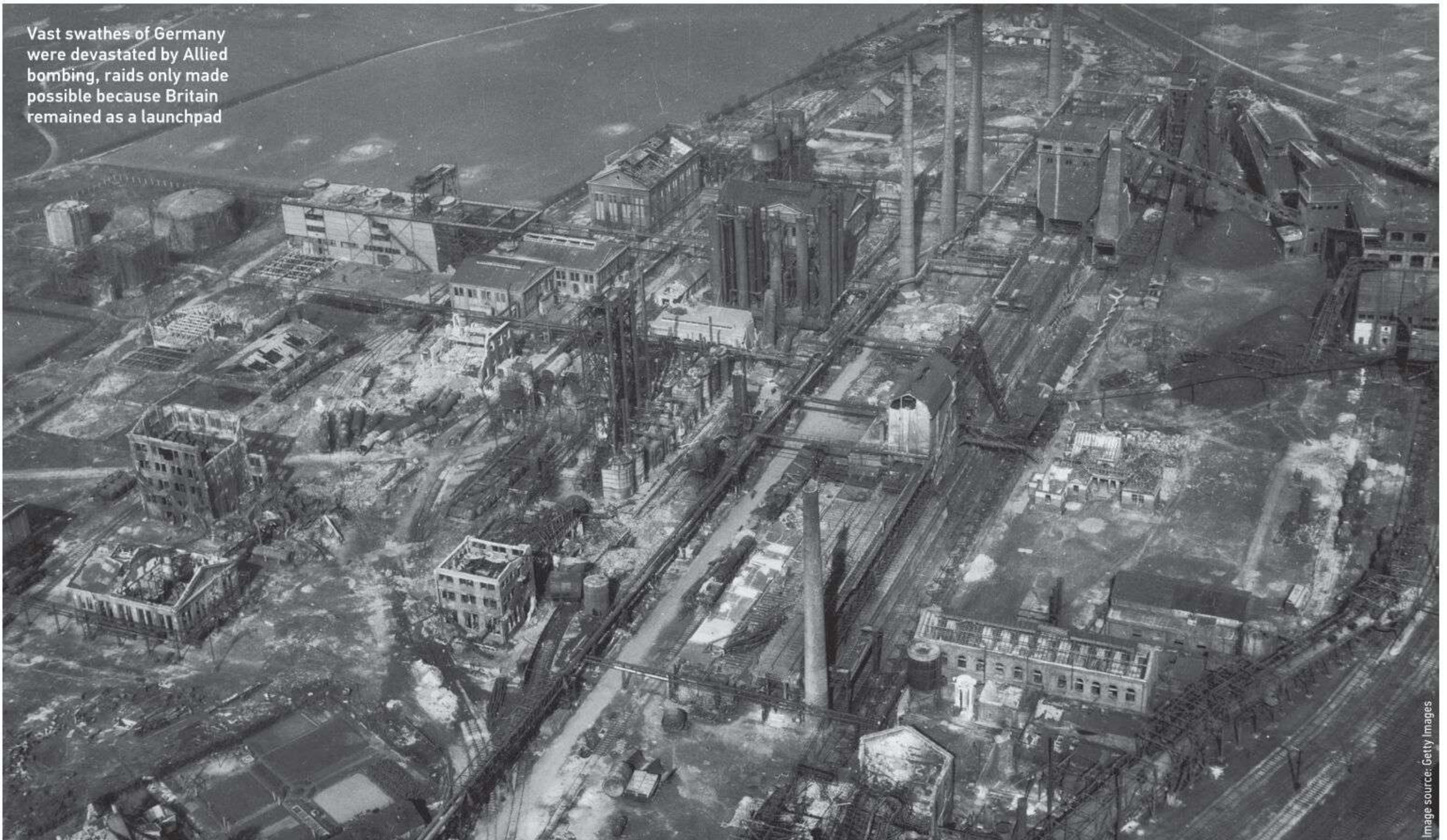


Image source: Getty Images

famous Prime Minister was bullish and firm in his resolve to refuse surrender. However, Churchill needed Halifax's and Chamberlain's factional support to control government and thus was on sensitive ground at the outset of the battle. If Germany had won the Battle of Britain, a British surrender was entirely possible.

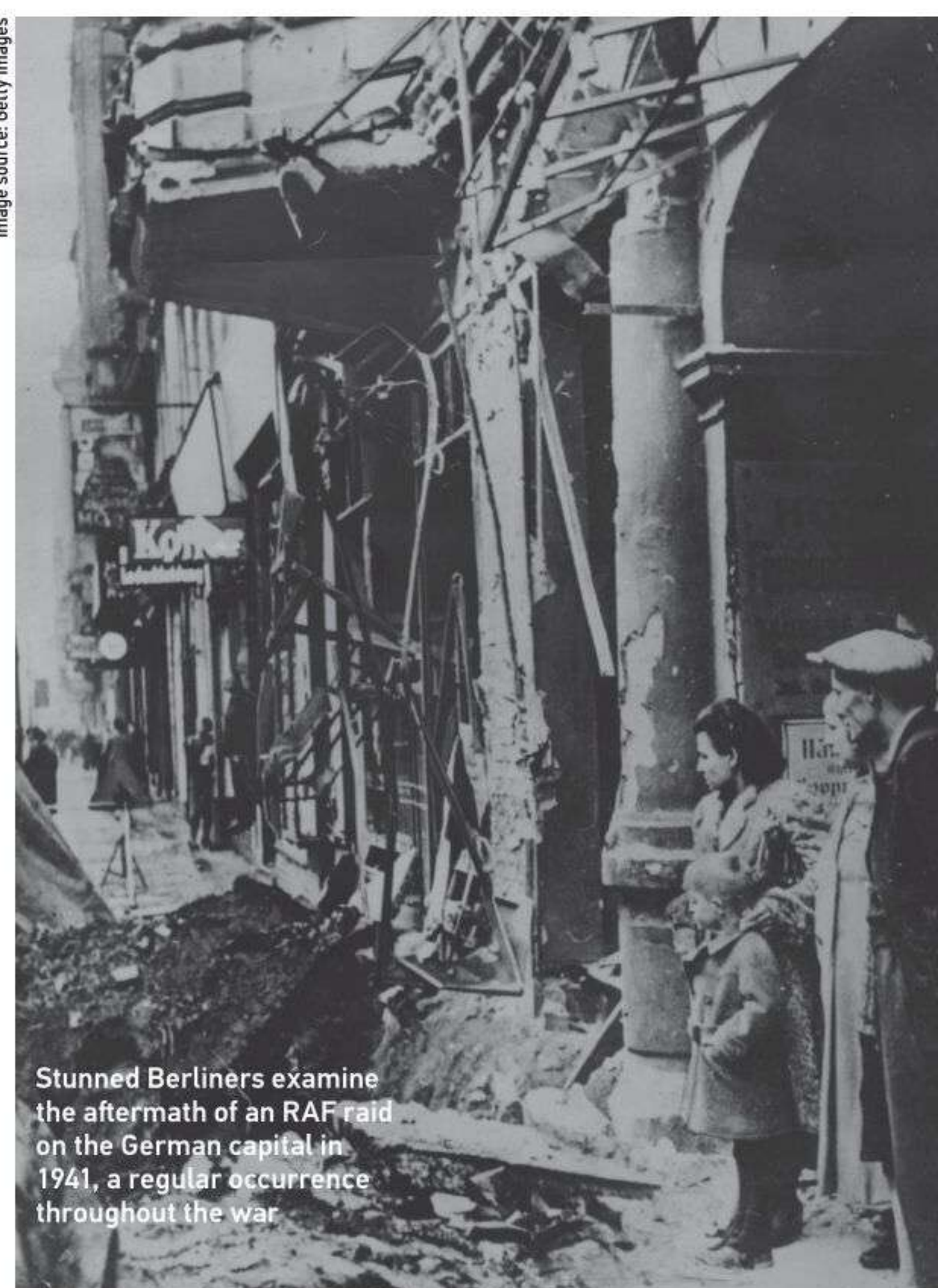
We cannot know what the price of surrender would have been for Britain. With Italy as mediators, Britain may have been stripped of some of its holdings abroad, which were eyed eagerly by the Italian Prime Minister Benito Mussolini. However, if Britain followed in the mould of France, a Nazi-sympathetic government would have almost certainly been installed in power. Such allies may have provided the German war machine with a coveted prize – the support of the Royal Navy. As the world's most powerful armada, the Royal Navy could have supported the German invasion of the Soviet Union by threatening Soviet holdings in the Baltics.

From the beginning of hostilities on the West, Hitler was aware of the danger of fighting a war on two fronts. Ever anxious to avoid being caught in a vice between the United States and Great Britain on one side and the Soviet Union on the other, Hitler consistently advocated for 'swift' campaigns to bring his enemies to heel. Ironically, by Britain enduring the German storm, Hitler inadvertently pushed Germany straight into the vice. Britain's campaign of

resolute defence was primarily a battle cry for the United States – and to a lesser extent the Soviet Union – to join the war on the side of the Allies. Britain's defiance was a symbol that Hitler was not irresistible and that the time was nigh to aid the British and prevent a dominant superpower emerging in Europe under the Third Reich. The United States was initially reluctant to join the war, but the Führer was not so confident about the Soviets. War in the East was a matter of when, not if, and with Britain still in play the Soviets became almost ludicrously boisterous in their negotiations with the Germans. The Nazis encouraged the Soviets to expand south while they continued conquering Europe. However, with German forces continually tangled up fighting the British, the Soviets ruthlessly pressed their own claims across the continent.

Hitler, always intending to betray the Nazi-Soviet pact, instructed his staff to begin plans for an invasion of the Soviet Union. This may have been much sooner than would have been optimal, but the British had indirectly forced his hand. On 22 June 1941 Operation Barbarossa was unleashed, and within days Germany's forces were scything a path deep into Soviet territory. This perhaps premature attack on the Soviets while Britain continued harassing Germany from the opposite flank ultimately preceded the first major reversal for Hitler, the Wehrmacht grinding to a halt in the city of Stalingrad in

Image source: Getty Images



Stunned Berliners examine the aftermath of an RAF raid on the German capital in 1941, a regular occurrence throughout the war

Britain's defeat would have tempted fascist leaders such as Mussolini to bolster their effort to seize former British overseas territories

"IT IS REASONABLE TO SPECULATE THAT IF THE RAF HAD BEEN EVISCERATED AS GÖRING HAD SO CONFIDENTLY PREDICTED, THE CALL FOR PEACE TERMS MAY HAVE BEEN OVERWHELMING FOR CHURCHILL"

Image source: Getty Images





LEGACY OF THE BATTLE



Oswald Mosley, leader of the British Union of Fascists, would likely have enjoyed a prominent role in a new, Nazi-friendly government if Germany had defeated Britain in 1940

Image source: Getty Images

August 1942. Yet this was not the only setback for which Britain could take some credit.

As the island had endured the Battle of Britain, Britain was able to continue policing its empire. Mussolini's forces had mixed success during their assaults on British holdings in Africa, but Britain's resistance deprived Hitler of additional allies. Philippe Pétain, Chief of State of the Nazi puppet state of Vichy France, and Francisco Franco, the revolutionary leader of Spain, were both unmoved by Hitler's pleas to attack Britain's holdings. If Britain had lost the Battle of Britain as anticipated, perhaps Pétain and Franco would have been stirred to action by fear of the Third Reich and the seemingly easy pickings offered by British-controlled territory. Instead, Hitler was denied reinforcements, and soon the tide began turning as the Soviets recovered and began their formidable counter-offensive.

The German invasion of the Soviet Union was useful for the Allies' long-term hopes of victory as well as bringing immediate reprieve to the British citizens, as the Luftwaffe was largely redirected to the Eastern campaign. From here, British morale improved significantly, as the pummeling from the Blitz had left many citizens feeling hopeless and abandoned by the government, much in contrast to the propaganda employed by Churchill's staff. With the skies above Britain once again much safer, the British would continue to be a thorn in Germany's side. The RAF continued to commit bombing raids on German industries

and the Royal Navy chased and sunk German battleships with vigour.

In December 1941, Japan (which was part of the Axis alliance) bombed the US-controlled port of Pearl Harbor. This decision was fateful; it was damaging but not crippling to the US Navy and provided President Franklin D. Roosevelt an opportunity to gain popular support to join the war. The US declared war on Japan, and, in a clumsy move of solidarity with their Axis ally, Germany responded by declaring war on the US. The vice was clamping shut. The British, with their new ally, first attempted to penetrate Germany via Italy after securing victory in North Africa. The Allies were successful in capturing the southern portion of the country but met formidable resistance as they progressed further north.

Fortunately, the island of Britain offered an alternative opportunity to take the battle to the Axis: it could provide a beachhead for a counter-invasion into German territory. The Allies would sail across the Channel and storm the beaches of Normandy on 6 June 1944. D-Day cost thousands of lives but was a grisly success for the Allies. It had taken almost five years, but Britain had at first survived, then hardened, and now was biting back into German territory.

Hitler could not have foreseen how influential Britain's victory in the Battle of Britain was destined to be. He thought the Blitz would force the Brits to surrender, but it had not. He thought he could deny the British an ally to the east but

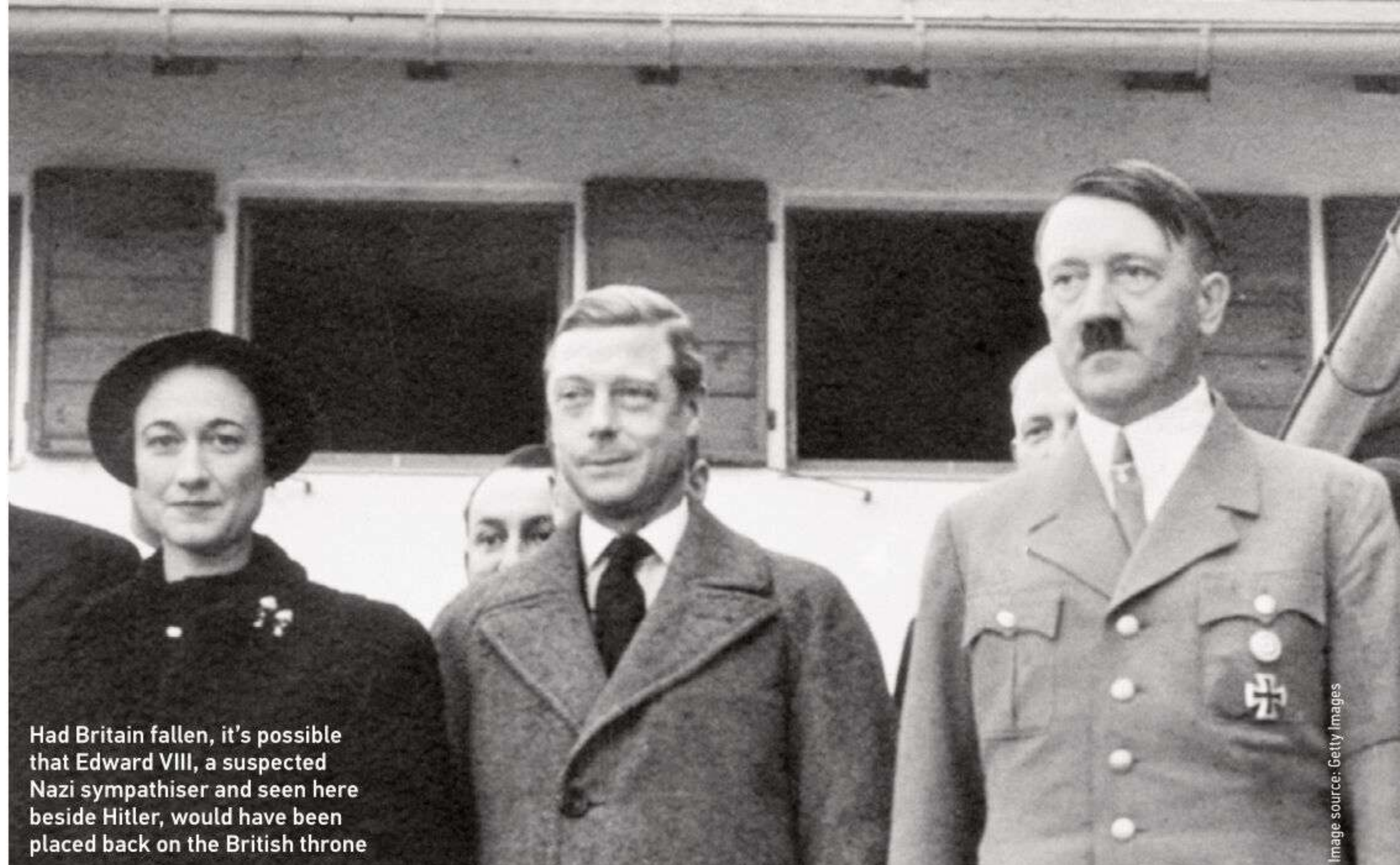
The D-Day landings of 6 June 1944 would not have been possible if Britain had fallen



ironically had played into British hands by invading the Soviet Union. He thought that if his forces acted quickly and decisively he could avoid a war on two fronts, but by 1945 the British and Americans were storming from the west while the Red Army of the Soviet Union marched on Berlin from the east. If Britain's victory in the Battle of Britain acted as anything, it was that of an anchor for those in the world who opposed the Nazis. The Battle of Britain was Hitler's first failure, and in some ways it helped to doom the Third Reich.

But what of the post-war implications of Britain's victory? For the Germans, their ultimate crushing between two blossoming superpowers sadly led to their country being fractured and severed in two. The Soviets captured the east and the Allies the west. Many Germans went hungry even in West Germany, with only the United States' provision of foreign aid preventing the mass starvation of millions.

For the British, there was a significant cultural shift during the war that had significant ramifications during peacetime. A major motivation for resistance against the Nazi regime within the population was cultural: the abhorrence of fascism and the egalitarian society that had worked in concert to support the British war effort. As such, a Labour government was voted into power in 1945 and installed policies that would create a welfare state and later the National Health Service. Resisting fascism and championing a communal investment into a common good had left Britain with strong national pride and an eagerness to provide common support following the devastation and hardships of war. The impact of this philosophy reverberates strongly in Britain today, and the country's history would likely have been strikingly different if it had been defeated.



Had Britain fallen, it's possible that Edward VIII, a suspected Nazi sympathiser and seen here beside Hitler, would have been placed back on the British throne



REMEMBERING THE FEW

"NEVER IN THE FIELD OF HUMAN CONFLICT WAS SO MUCH OWED BY SO MANY TO SO FEW"

Pilot Officer Geoffrey Page took part in the Battle of Britain at the tender age of just 20 years old. He was initially disappointed to find himself assigned to a squadron flying Hurricanes instead of Spitfires, but he soon settled into his cockpit and proved himself an able fighter pilot. Page successfully downed multiple enemy aircraft but in August 1940 found himself on the receiving end of enemy fire. During the attack his plane burst aflame and the young pilot suffered serious burns to his hands and face before ejecting from his aircraft.

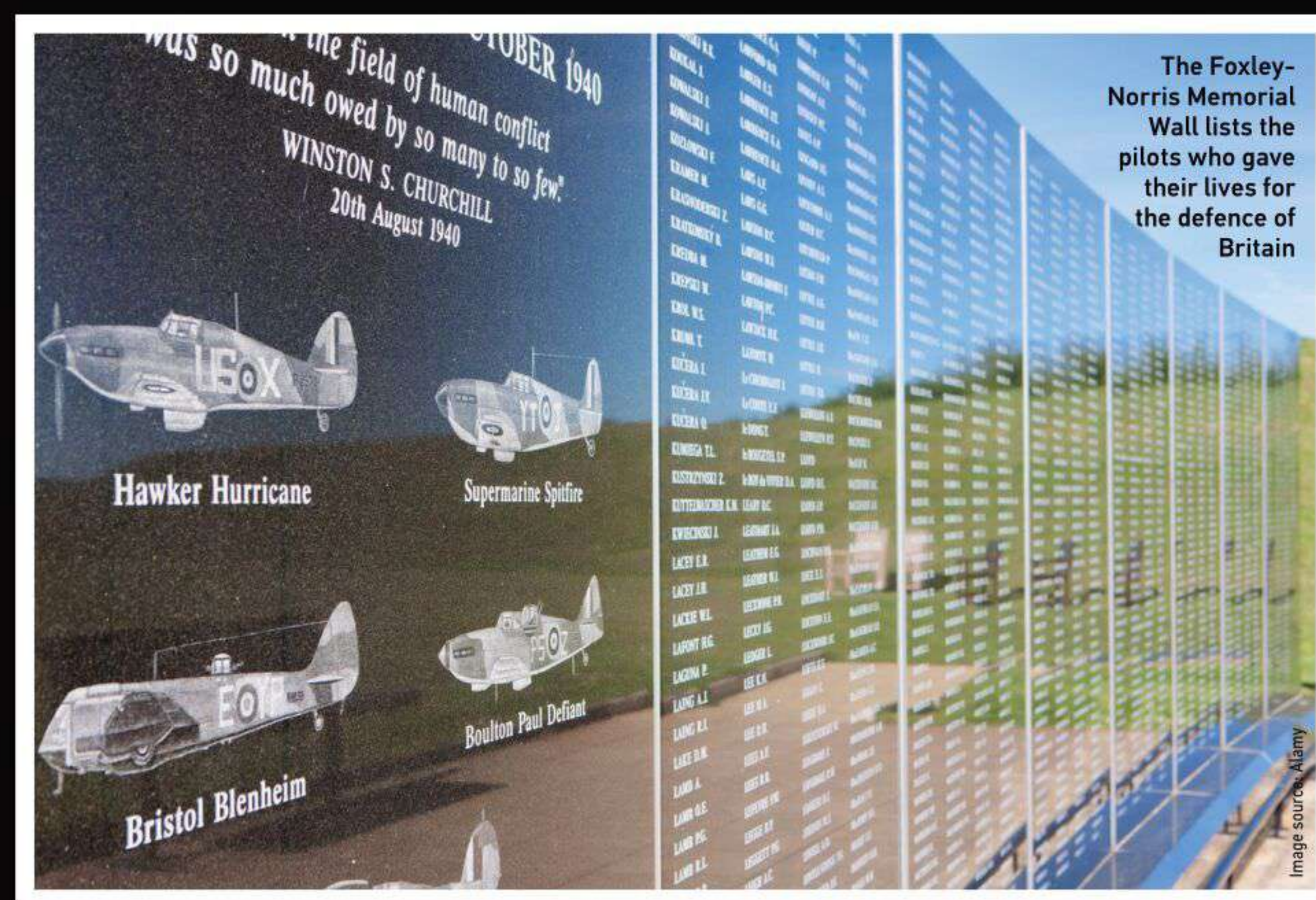
Page was moved to the Queen Victoria Hospital for treatment and received pioneering reconstructive surgery from Archibald McIndoe. While interned at the hospital, Page was a founding member of a patient support group for wounded and disfigured pilots who'd undergone multiple surgeries. The social club

called themselves the Guinea Pig Club, due to the experimental nature of the plastic surgery carried out by McIndoe. Despite his injuries, Page underwent several more surgeries so that he could return to the air, and after having achieved this notched up 15 enemy 'kills' before suffering another crash in 1944.

Once again Page survived, and he was later instrumental in launching the Battle of Britain Memorial Trust to remember his former comrades who had not been so fortunate. Today 'the Few' are remembered on the Foxley-Norris Memorial Wall, overlooked by busts of Air Chief Marshals Sir Keith Park and Lord Hugh Dowding. The memorial site sits at Capel-le-Ferne in Kent, below where much of the action took place. At the centre of the site rests a sculpture of a sitting airman, staring pensively towards the sea where enemy aircraft once appeared on the horizon.



Image source: Getty Images



The Foxley-Norris Memorial Wall lists the pilots who gave their lives for the defence of Britain

Image source: Alamy



COULD HITLER HAVE WON?

Britain's victory in 1940 has rightly gone down in the annals of history as a key turning point in WWII, but could the outcome have been different? We talk to author and historian **Sir Max Hastings**

Q. It is often said that only the RAF stood between Britain and the Luftwaffe, but the presence of the Royal Navy was of course a key deterrent to a German invasion. With that said, did Germany ever have a realistic prospect of victory in the Battle of Britain? If so, how could Germany have achieved it?

The RAF was likely to win the Battle of Britain because it was playing at home with good aircraft, technology and commanders. But the outcome

governments – to prioritise the construction of fighters over bombers – and some brilliant air chiefs and scientists. But the Germans nonetheless had superiority of mass together with better fighter tactics. The RAF's Hurricanes and Spitfires were good aircraft, but their .303 machine guns lacked killing-power unless pilots were very skilled and courageous enough to get really close. The 'fighting area attacks' laid down in official doctrine, wherein squadrons were

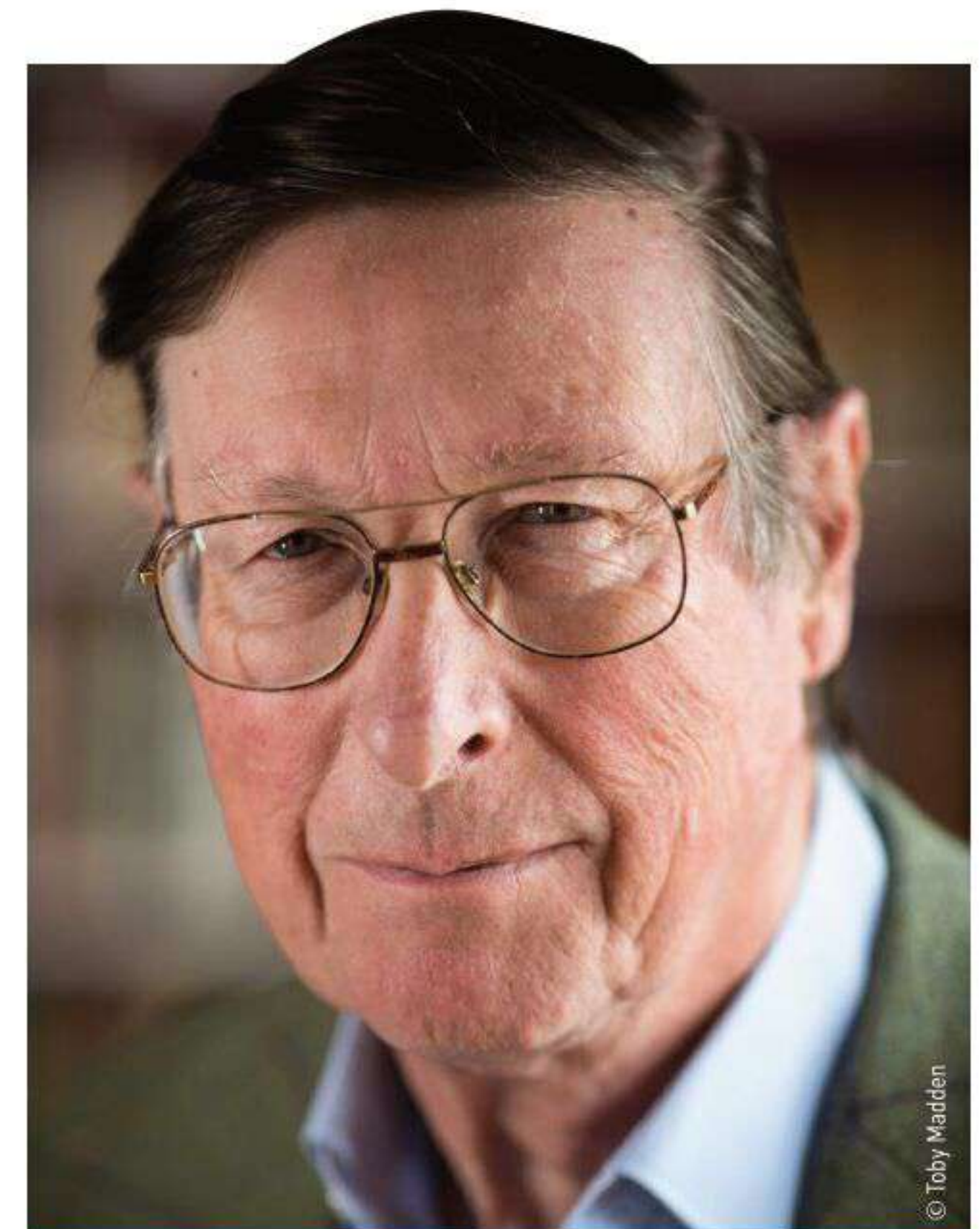
"IF THE GERMAN ARMY HAD BEEN ABLE TO ESTABLISH A BEACHHEAD, THE BRITISH ARMY WOULD HAVE BEEN INCAPABLE OF RESISTING A FULL OCCUPATION"

of the battle was certainly not inevitable and it might have been different had the Germans run the campaign better.

It is true that air defence of the home island was almost the only contingency for which Britain entered the war well prepared, thanks to one good decision by the Baldwin and Chamberlain

supposed to deploy in formations, were fatally flawed and hopelessly inflexible in comparison with the Luftwaffe's 'Finger Four' – the 'schwarm' – developed in Spain.

The only scenario in which the Germans might have prevailed in the Battle of Britain required the Luftwaffe first to knock out radar stations



SIR MAX HASTINGS

is an author, journalist and broadcaster whose work has appeared in every British national newspaper. The former Editor-in-Chief of the *Telegraph* and the *London Evening Standard*, he has published 27 books to date, including various titles focused on WWII, such as *All Hell Let Loose*, *Bomber Command* and *Chastise*. Knighted in 2002 for services to journalism, he now reviews regularly for the *Sunday Times*.

and southern airfields, then to wreck Fighter Command in the air by attrition, exploiting Bf 109 drop tanks; then to use the dominance they achieved to wreck key factories, especially those making aircraft. These were all big 'ifs'.

Q. How important was Hitler's decision to shift the focus of the Luftwaffe's assaults from airfields and industrial targets to cities in determining the outcome of the battle?

The biggest German mistake, which the British would later repeat in their bomber offensive against the Reich, was repeatedly to switch targets, partly as a result of lacking good intelligence about Britain's defence, and especially its fighter direction system. They should have systematically taken down British radar stations and airfield facilities before attacking anything else. It was a disastrous mistake to start bombing London, which, as Churchill wrote, was like a huge prehistoric animal, capable of absorbing enormous punishment.

It is extraordinary that the Luftwaffe failed to exploit long-range fuel drop tanks, a technology that it did possess, to extend fighter endurance over Britain. This could have been a game-changer. If the German Bf 109s had not been obliged to go home so quickly after entering British air space, if they had been able to provide extended cover for the bombers, the balance of losses could have shifted dramatically.

But British fighter production was outpacing that of Hitler's air force by August 1940, and continued to do so. Only if the Germans, instead of essentially 'area bombing' London and other cities, had been able to cripple fighter production in factories in the English Midlands might they have improved their prospects of achieving dominance.



Hitler and Göring's key error was to shift the focus of attack away from British airfields and radar stations to major cities

Image source: Getty

For all its superior expertise in the use of fighters, no more than the RAF had the Luftwaffe seriously addressed the question of what weight of bombs would be needed to make a decisive impact on a large, dispersed industrial production such as Britain possessed. Every nation entered the war supposing that the mere fact of bombing, especially in areas with large civilian populations, would make a decisive moral impact. This proved to be untrue.

Q. If Germany had managed to secure aerial superiority in the skies above Britain, do you think Operation Sealion would have followed immediately, or would the lack of preparation for a full-scale amphibious landing have hindered Germany?

Even if the Luftwaffe achieved command of the sky, the Royal Navy's Home Fleet represented an equally serious threat to an invasion force, when the German navy's cruiser and destroyer force had been devastated in the Norwegian campaign, and the Germans had only negligible shipping capable of participating in amphibious operations. Even if the Luftwaffe could give effective protection to an invasion fleet in daylight, it could not shield it in the hours of darkness, when the Royal Navy could wreak havoc against slow-moving barges. I suggest that if the German army had been able to establish a beachhead in South East England, the British army would have been incapable of resisting a full occupation of Britain. But it is wildly unlikely that Hitler's naval forces could have achieved this.

Consider the simple fact that it took the Americans and British more than a year to organise the June 1944 invasion of Normandy, with access to far greater resources than Hitler had. It was an almost impossible task, for the Wehrmacht and Kriegsmarine, to lay on an invasion of Britain, behind its 'moat' of the Channel, in two months.

Hitler would have far better served his own interests had he chosen simply to ignore Britain after the fall of France. The British were incapable of interfering with his command of the continent. Had he focused on seizing the Mediterranean and Middle East, which I believe he could have done, he would have laid bare British impotence and quite possibly caused Churchill's government to fall, to be replaced by an administration that offered to negotiate a peace.

As it was, by threatening Britain and attacking it from the air, Hitler provided Churchill with a great task that everyone in Britain could comprehend. The Prime Minister kept people digging trenches and building pillboxes not only through the summer of 1940 but for years after the real prospect of invasion had passed. Defending their own island gave every one of the inhabitants of Britain a sense of purpose they could have found in no other way.



The Messerschmitt Bf 109E was a formidable adversary, but it couldn't secure victory in the Battle of Britain

The Luftwaffe's failure to destroy the RAF provided Churchill with an opportunity to rally the nation



Image source: Getty

Moreover, by attempting to secure aerial dominance over Churchill's island and being seen to fail in the attempt, Hitler presented Churchill with a great victory. He was able to tell the British people, and the world, that they had achieved something great, and so they had, even though Hitler's power remained as robust in October 1940 as it had been in June, and the British were still incapable of doing anything about it.

The Battle of Britain was a huge moral victory for the British and a major defeat for the Germans in the eyes of the world, because it was the first thing Hitler had ever attempted – quite unnecessarily – in which he was seen to fail.

Q. How might World War II have played out differently if Britain had been defeated?


Counterfactuals about big issues are always problematic, because as the great Professor Sir Michael Howard said, once you change one variable, all manner of possibilities open up. I would make a wild guess that if Britain had been

defeated and occupied, the United States would have been most unwilling to enter the war, unless Hitler had been rash enough to provoke her into doing so.

It is likely that, even if Hitler had not launched an invasion of Russia, Stalin would have gone to war with him sooner or later because of Hitler's ambitions in the East and the Soviet imperative to frustrate them. I'm inclined to believe that the Red Army could have fought the Wehrmacht to a desperate stalemate. Nazi dominance of Europe might have continued for some years, but sooner or later I suggest that Hitler's literally insatiable ambitions would have been frustrated in blood, mostly by the Russians.

The biggest doubt that persists in my mind, in any scenario that attempts to anticipate German victory, is that even if the Luftwaffe had fared better in the Battle of Britain, I question the feasibility of Operation Sealion. Hitler should have left the British to stew in their own juice and focused on securing his dominance of the continent.

With thanks to Sir Max Hastings for kindly taking the time to answer our questions on the Battle of Britain.

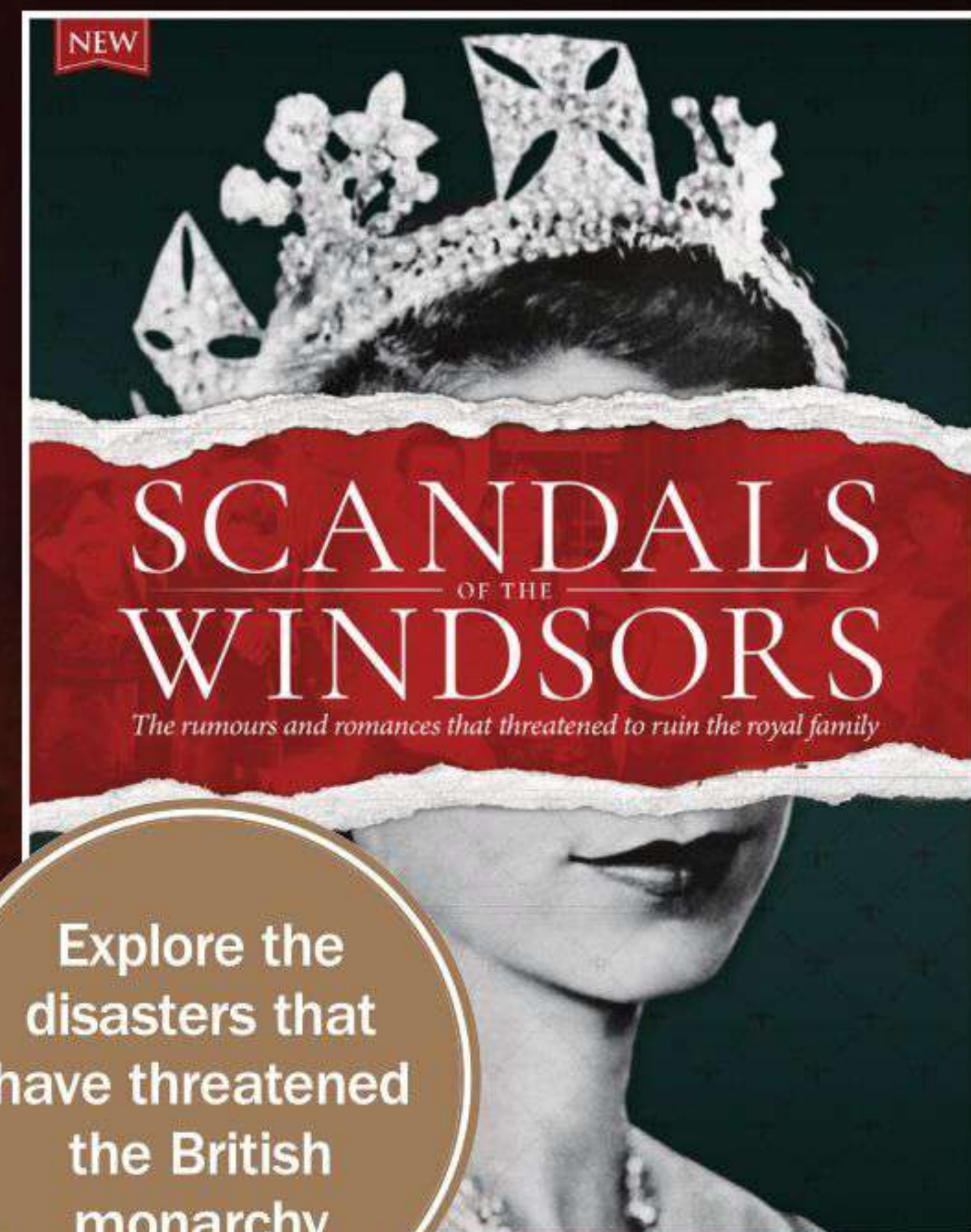
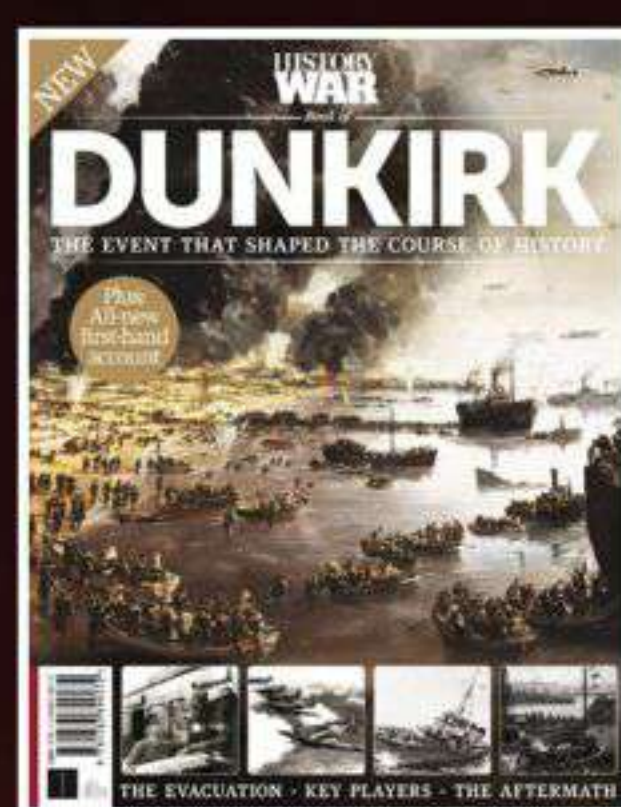
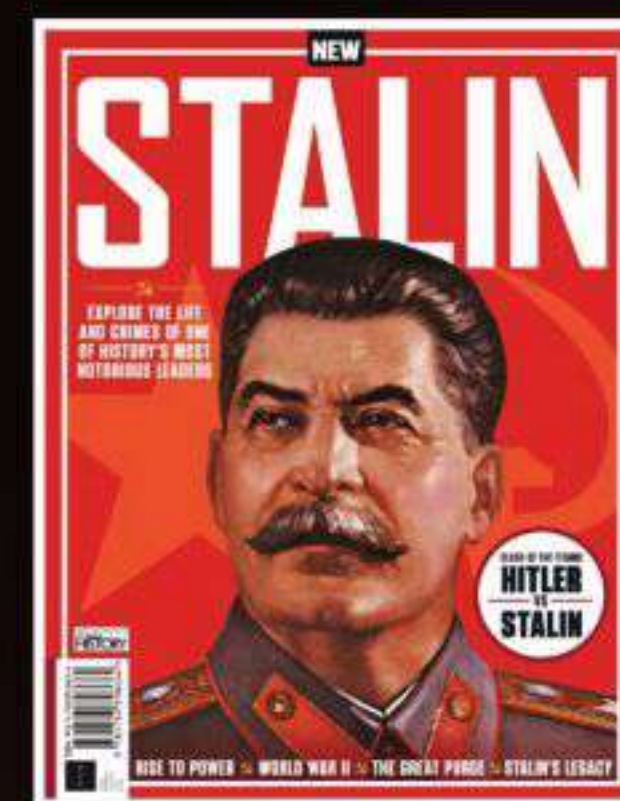
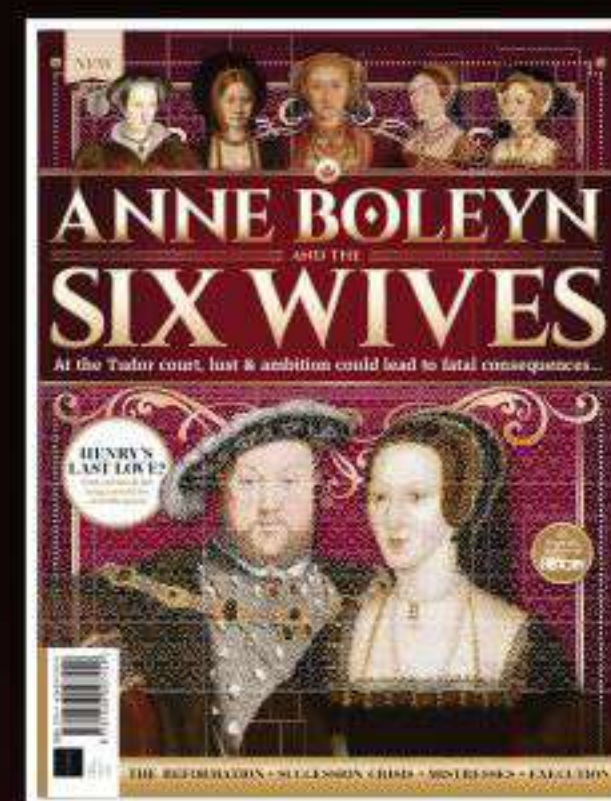
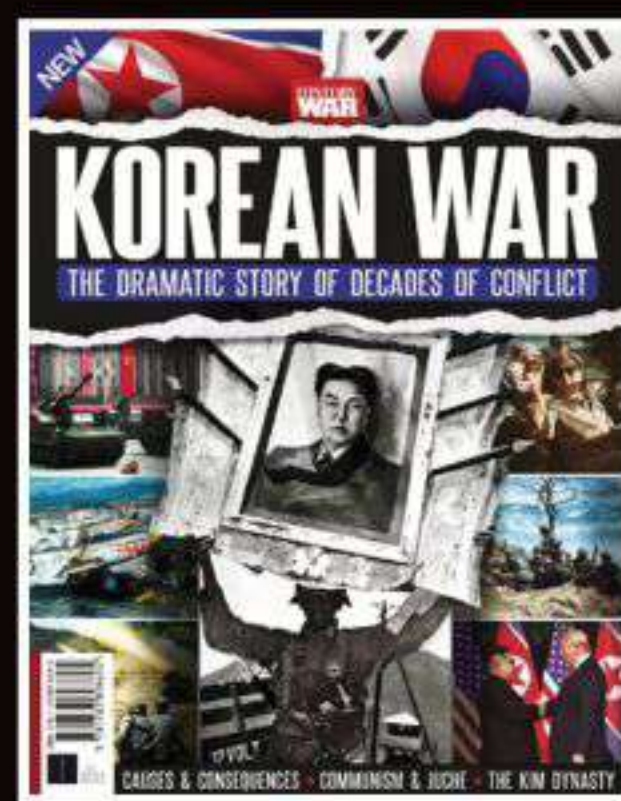


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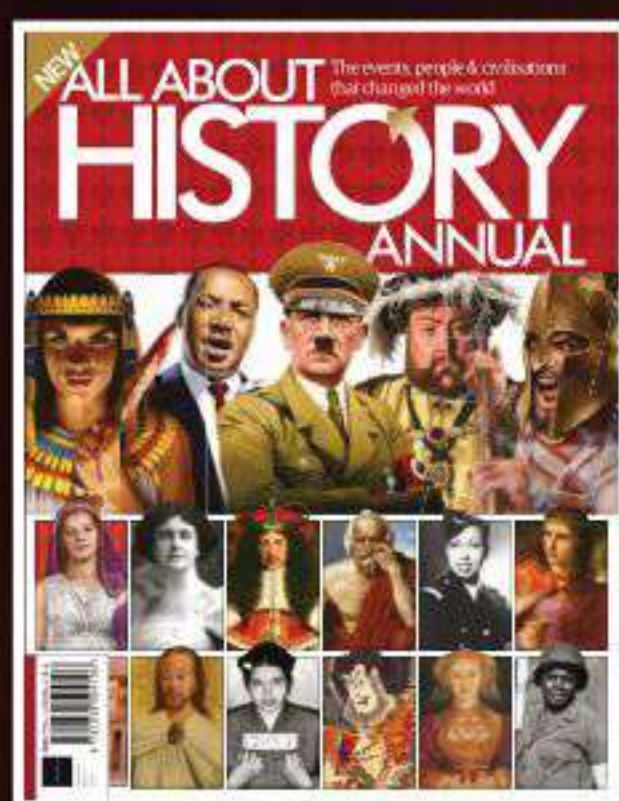
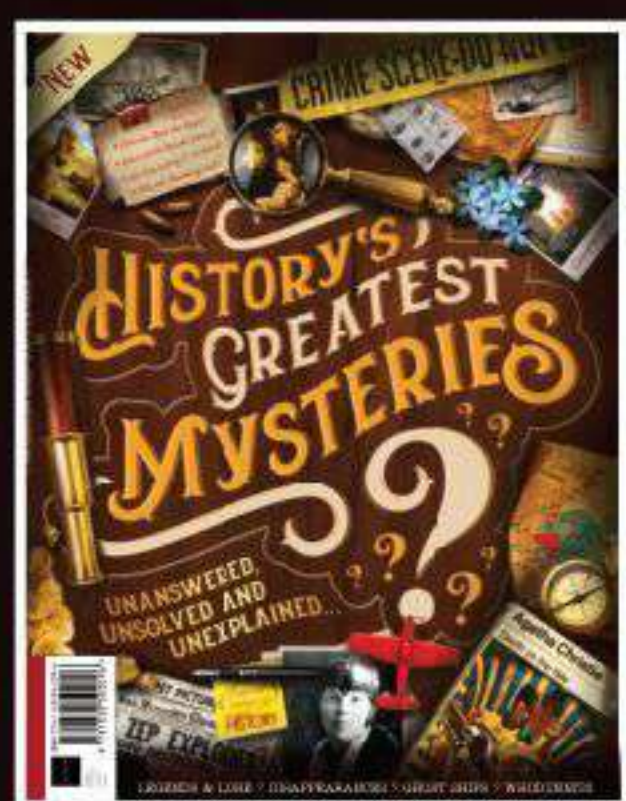
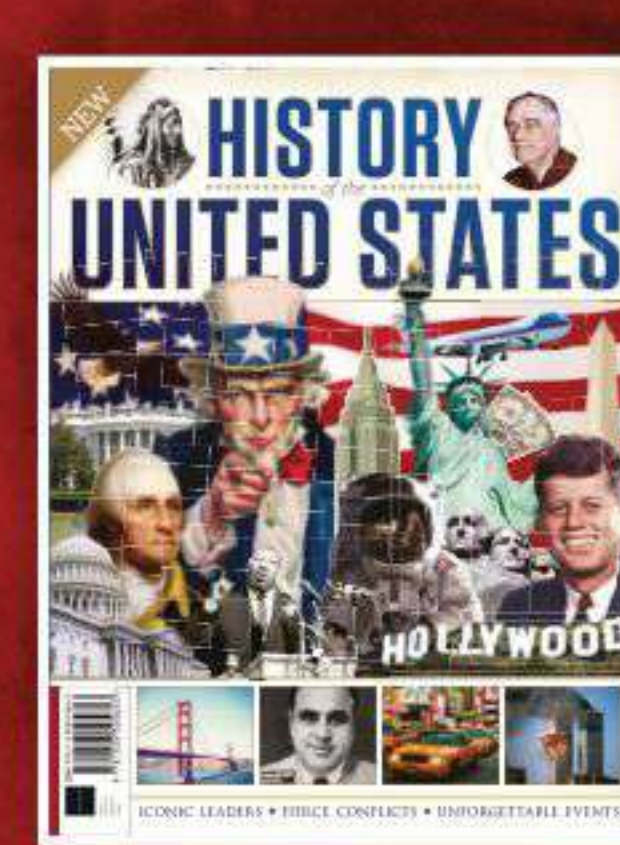
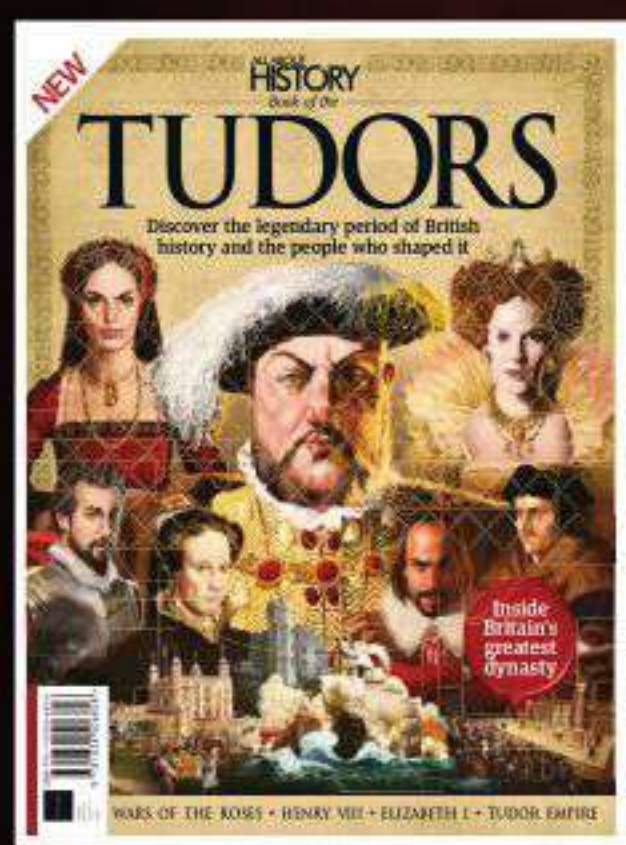
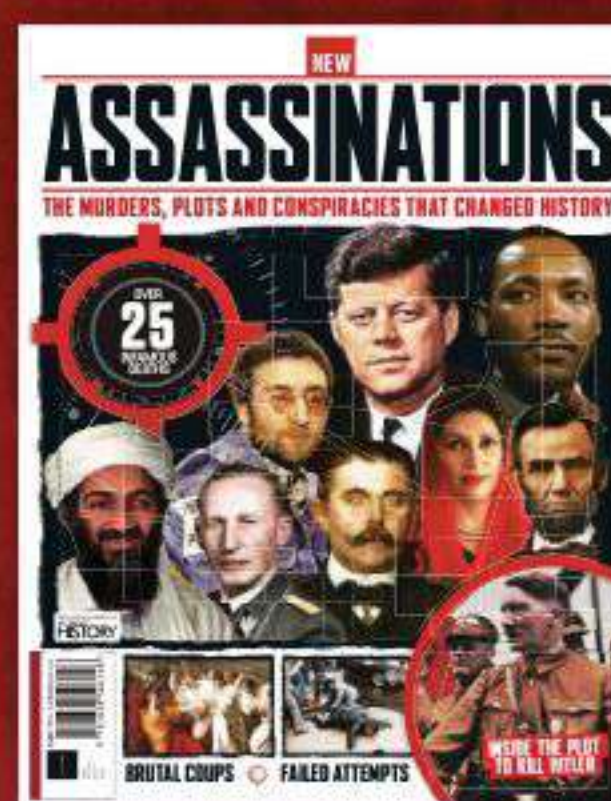


Chart the rise of Hitler and learn how he set Germany on the path to war



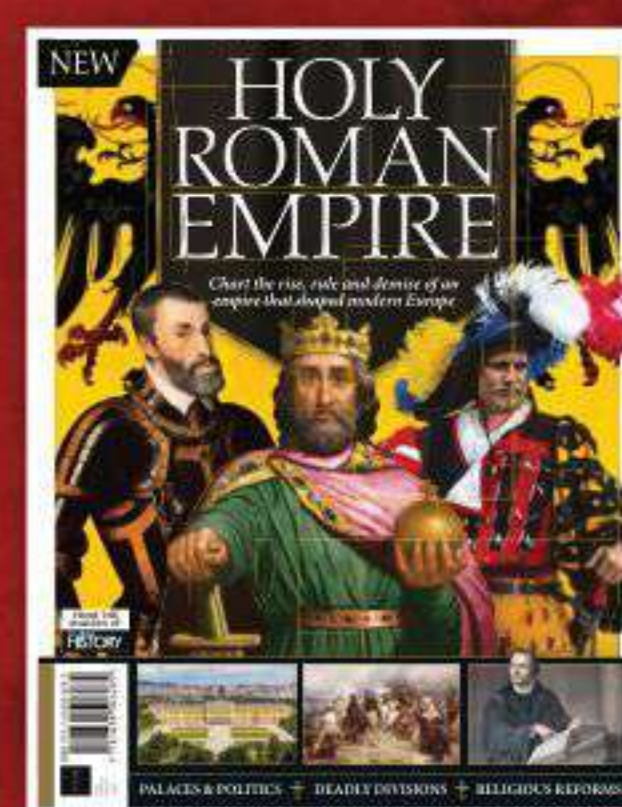
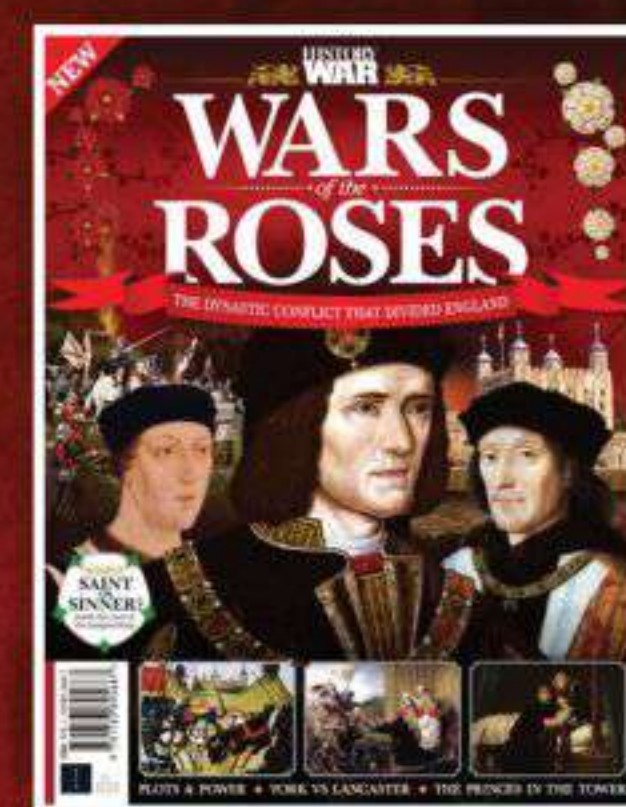
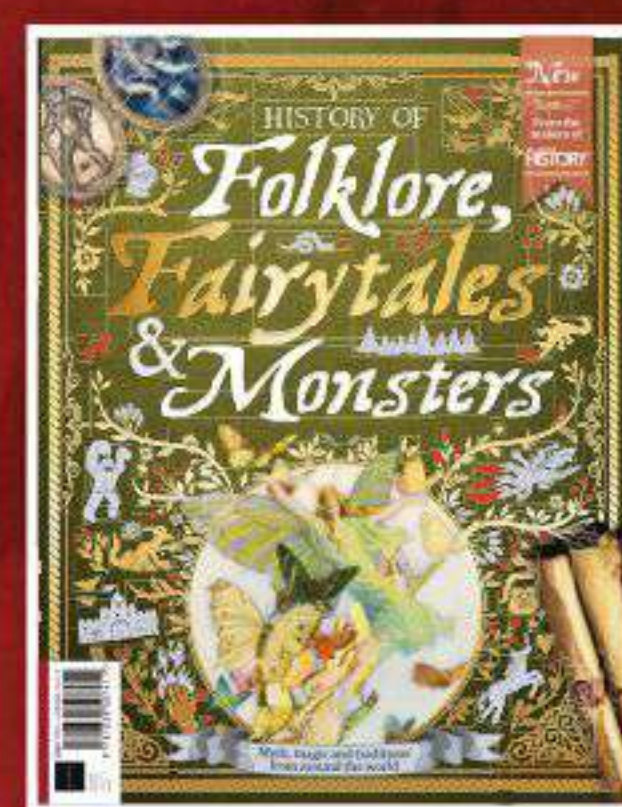
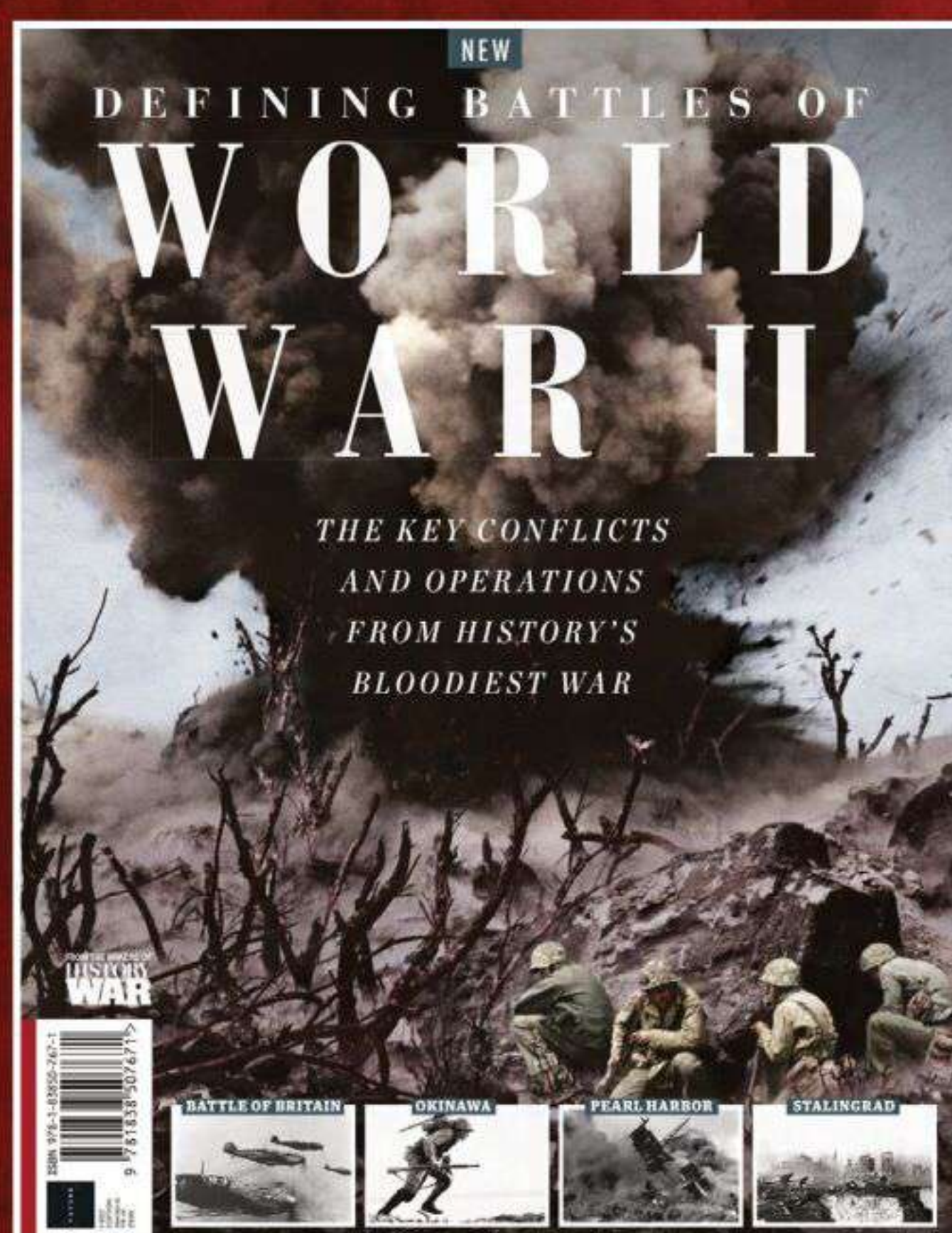
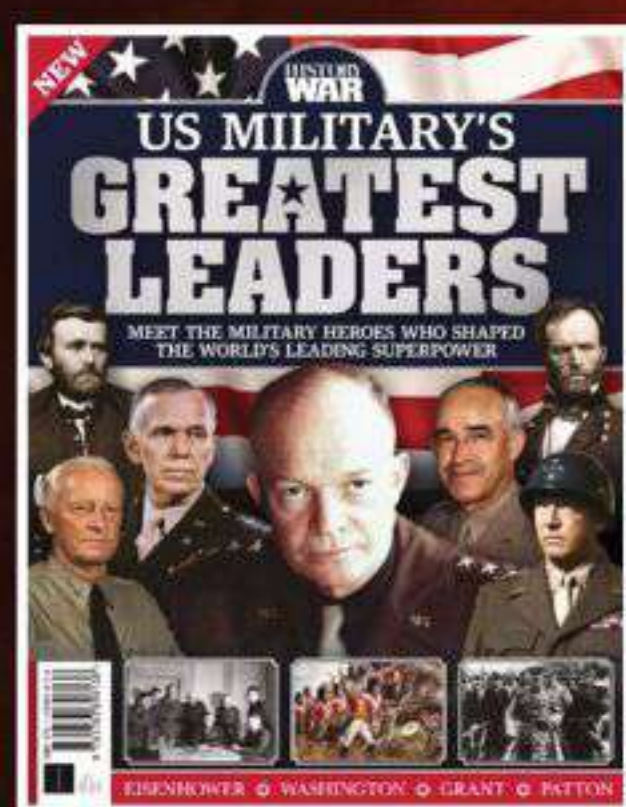
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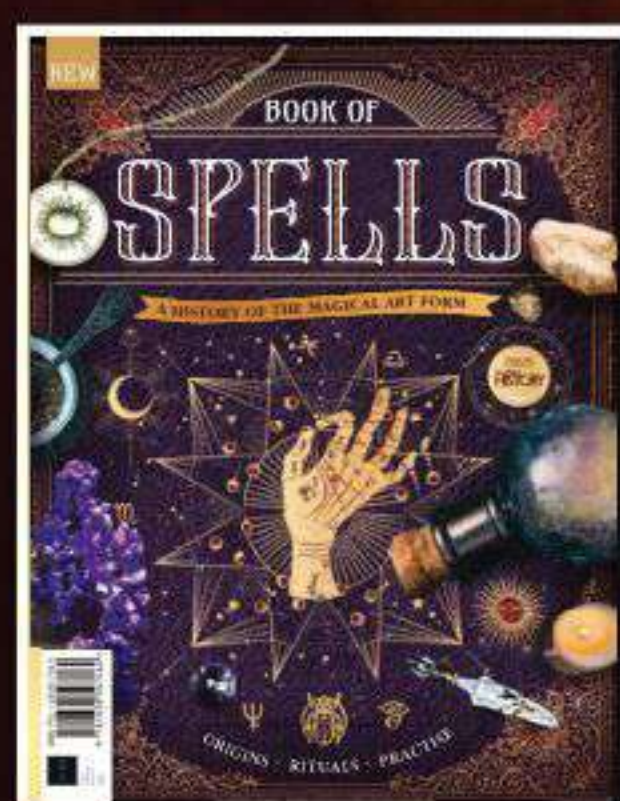
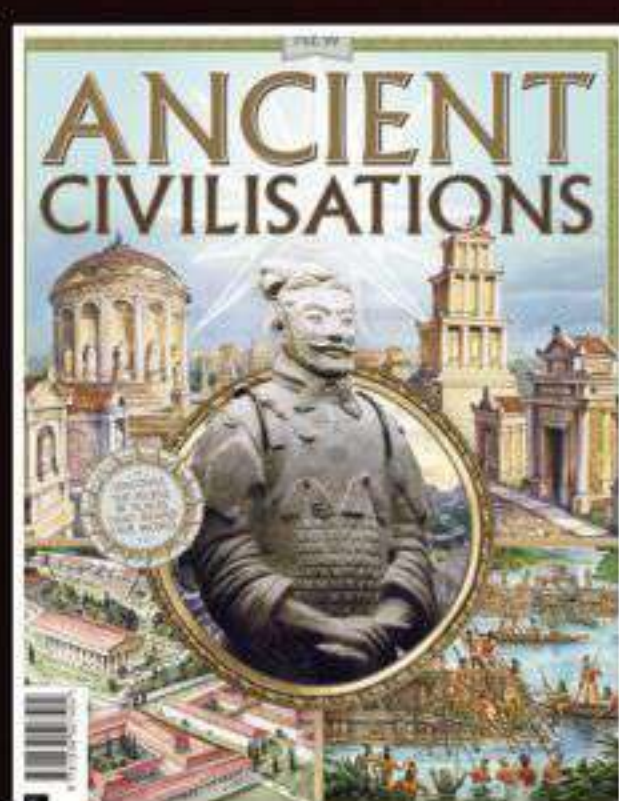
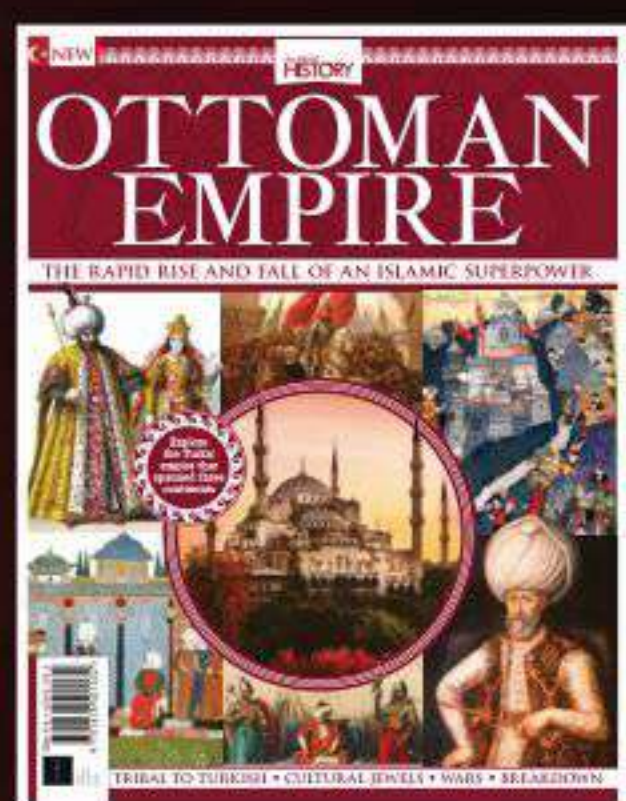
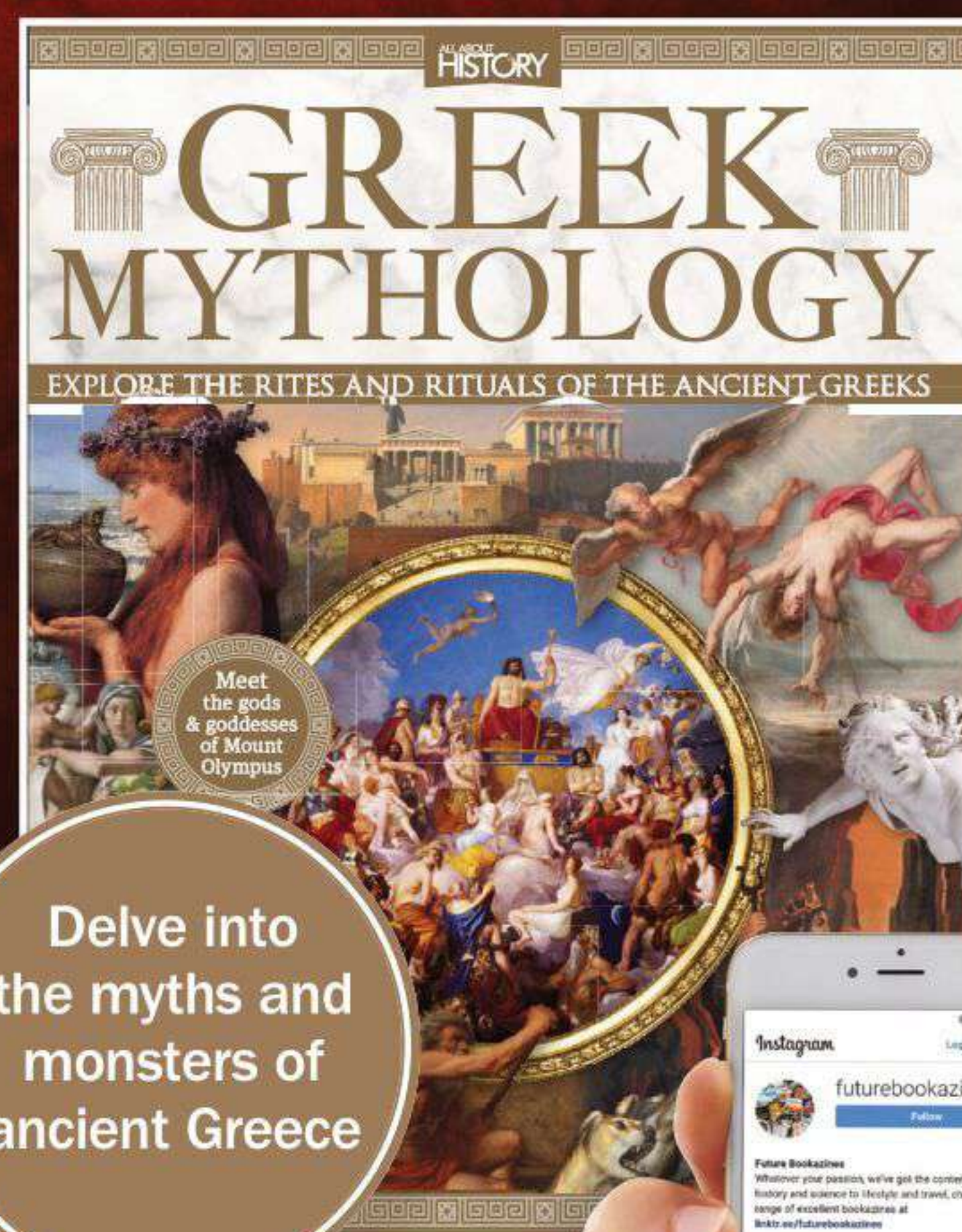
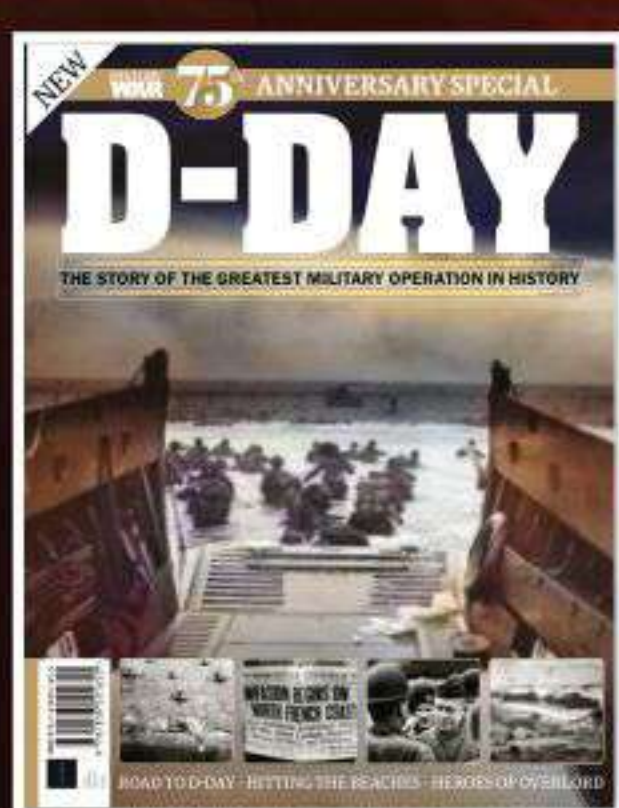
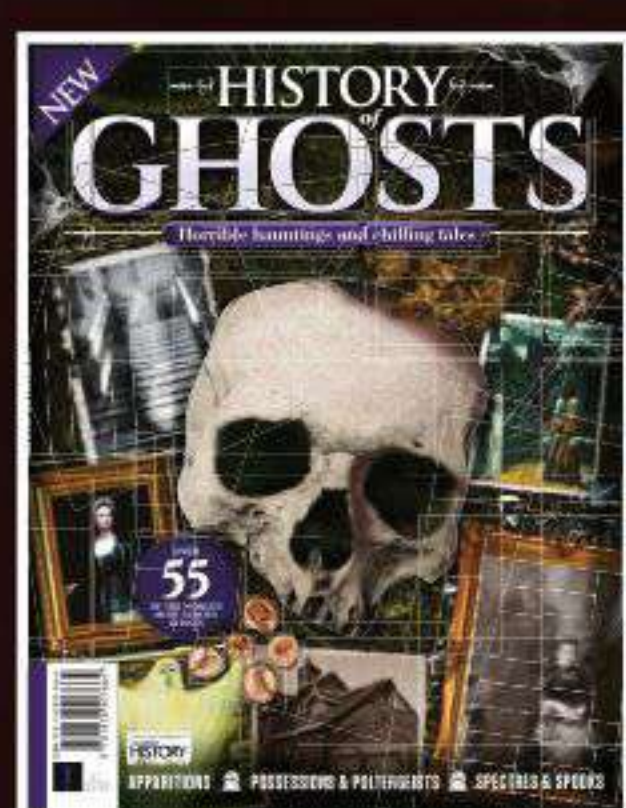


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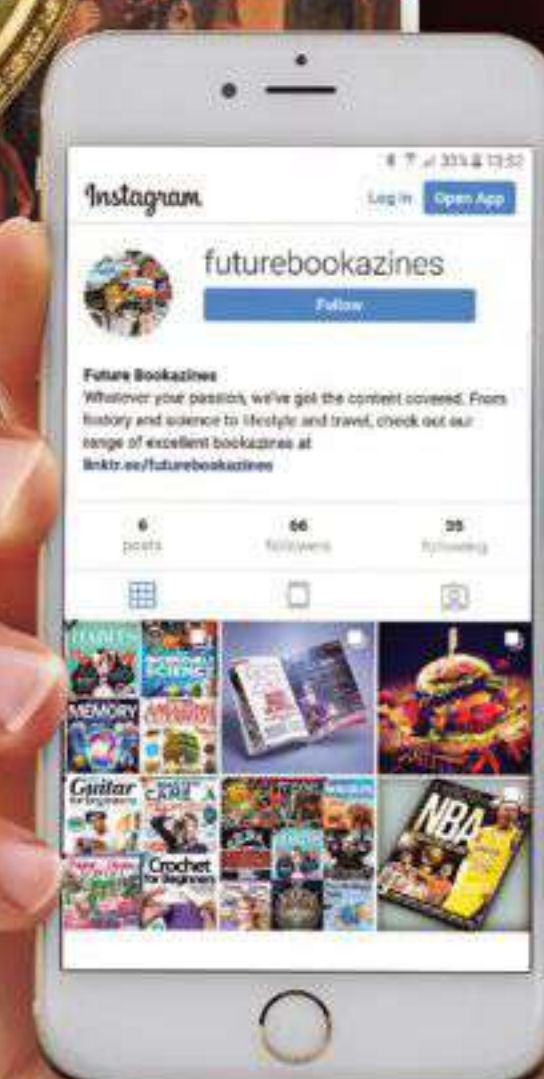


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